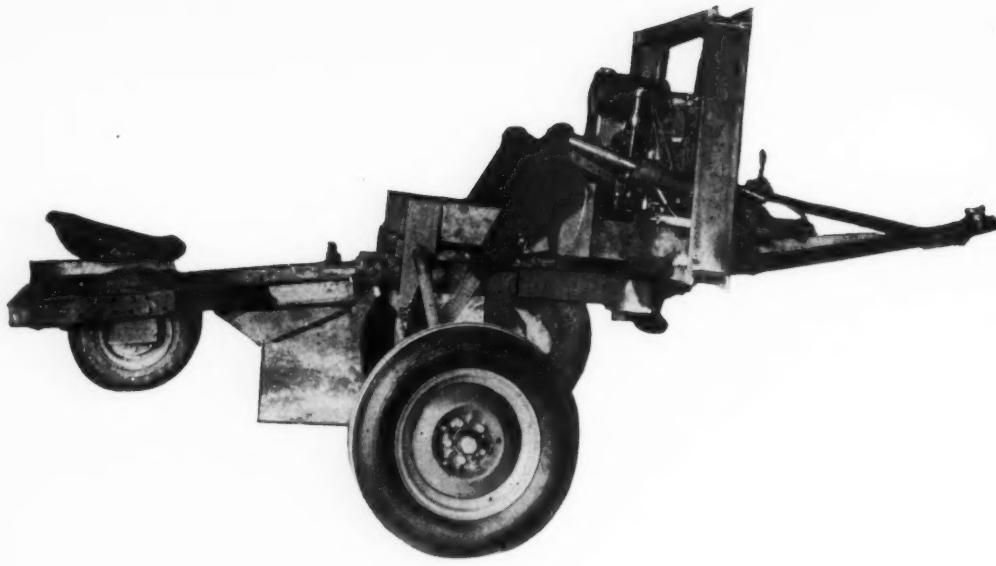


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AMERICAN FORESTS

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THE COVER

The two blithe spirits on this month's cover are Jack Gaffney and Bob Nolan—as jaunty a pair of fugitives from a truant officer as one could hope to meet. Commenting on his picture taken near a certain 'fishin' hole' in Pennsylvania, Edward Carlin, of the Harold M. Lambert Studio staff, said, "we have captured here, I think, one of the grand moments of boyhood." We agree. In future years Jack and Bob may go fishin' again with more elaborate equipment and a greater sense of escape from life's responsibilities but it won't be quite the same. The relationship between boyhood and spring is as close as sulphur and molasses.

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LETTERS TO THE EDITOR

Early Foresters

Dr. Graves' interesting description of the beginning of forestry education in the February issue suggests that he be urged to prepare other reminiscent articles on the development of federal forestry activities. Certainly there is no one else as eminently qualified to present this material.

One point Dr. Graves did not stress is that early foresters, in the field of education and in actual practice, were as a rule recruited from among those trained in the botanical sciences rather than in engineering or economics. For example, at Michigan State College the eminent botanist, Dr. William J. Beal, was appointed to the chair of botany and forestry in 1882. He held this position until 1902 when a separate chair of forestry was established. The first incumbent, Ernest E. Bogue, also had a botanical background. It was under his direction that the full professional forestry curriculum was first offered in 1903. That first professional class consisted of twenty-five students, with three on the staff. Today we have over 600 students with twenty-six on the staff exclusive of graduate assistants!

Paul A. Herbert
Michigan State College
East Lansing, Michigan

In Defense of the Old-timer's "Pine"

In February "Letters to the Editor," Dr. Stanley W. Bromley of Bartlett Tree Research Laboratories at Stamford, Connecticut, has seen fit to belittle the old familiar "Twin Pines" sign in front of roadhouses, tourist camps and country hotels.

In my early childhood we had a tree in front of my father's house which was referred to as "the pine tree." Later, I discovered to my great chagrin that it was a Norway spruce and, of course, thereafter I was very particular to refer to it as such. But still later I found that the old-timers were not so very wrong at that, as is often the case when we take the trouble to make a thorough study of the subject.

Specifically, on page 8 of *The Manual of Cultivated Trees and Shrubs*, by no less an authority than Alfred Rehder, we find: PINACEAE, pine family which includes all the firs, the Douglasfir, the hemlocks, all species of spruce, the larches, the cedars, the pines (*Pinus*) to which, of course, he refers; and arborvitae which he says is the ultimate mistake; and we also find the cypress, and the juniper included in the pine family.

So let us look with some humble admiration at the works and hopes of these, our predecessors, who had the courage to establish a home, a farm, or a business for us to enjoy.

Donnell Marshall
Pottstown, Pennsylvania

Yes, Sir — Will Do

I am wondering whether you could follow-up on the story "Seeds Away," by H. H. Henry, which appeared in *American Forests* for March, 1947? Quite a number of journalists appeared in print during the past several years with glowing accounts of

the possibilities in seeding dry range lands with pelletized seed. Isn't it time that some follow-up work was done on success or failure from this spectacular and tremendously expensive, much ballyhooed method, which to my way of thinking has very little scientific justification?

I am unable to learn of any real success as yet from broadcasting pellets on semi-arid ranges. This is an important question because of the large sums of money which Congress continues to appropriate for these projects. It is disconcerting to note how the work of all of the range ecologists in the western experiment stations, and their recommendations, have been ignored. This program has gone on mainly under agencies without trained scientific personnel and without control checks on quality of the method.

Your magazine would be doing the people a real service by calling attention to the true status and results of these projects.

Joseph H. Robertson
University of Nevada
Reno, Nevada

Ever Hear of "Osmose", Mr. Fritz?

In "Letters to the Editor" for January there appeared a letter from Professor Emmanuel Fritz of the School of Forestry, University of California. This concerned the protection of wood against decay. The third paragraph states that "... no preservative, however good, is effective unless it is injected into the wood under pressure. This is possible only at a specially set up plant. Painting or dipping the wood is waste of materials and time."

This statement is astonishing. Professor Fritz apparently does not realize that a large proportion of wood treated in this and other countries is done by a simple method which takes into account the natural chemical phenomenon of osmosis. This process, known as the "Osmose" process, is very widely known and recognized. Its service record has been excellent. It eliminates the use of forced mechanical pressure in preservative application, which has definite disadvantages for certain types of wood.

The idea is entirely too widely accepted in this country that the use of forced mechanical pressure is the only effective means of preservative application. Time will prove my point. More science and less lobbying is what we need.

Joseph M. Bray, Ph.D.
Osmose Wood Preserving Company
Buffalo, New York

Poisoning Our Soil

Ray A. Pendleton, in his letter published in your January issue, asks where Mr. Oliver would get his food if no insecticides or fungicides were used. The answer is that he would get it from the same source that his ancestors got it through countless generations: from good, healthy, unpoisoned soil. Insecticides and fungicides were unknown to my grandfather and known to my father only in the closing years of his life. Yet both grew vegetables and fruit with far less trouble from insects and diseases than most growers encounter today.

Mr. Pendleton assumes that pests and diseases are less troublesome in this day of poison sprays than in years gone by. The exact opposite is true. The tremendous growth in the use of sprays has been accompanied by a corresponding increase in the prevalence of pests and plagues. It is rapidly becoming apparent that when we try to destroy pests and diseases with poison, whatever temporary success we may have is only at the expense of poisoning our soil—a fact which should have been apparent to us sooner, since any poison sprayed on a plant sooner or later (as Mr. Oliver pointed out) finds its way to the soil.

The soil is a teeming world of living organisms. It is on many of these that the plant relies for its health. Poison the soil and the organisms are killed. As an inevitable consequence, the plant sickens and becomes an easy victim to insect pests. This is not mere theory; discoveries in its support have been reported from all parts of the world and in connection with all kinds of crops from wheat to potatoes and from pineapples to sugar cane. If Mr. Pendleton is curious, I shall be glad to refer him to reports of scientists who have made these discoveries.

Leonard Wickenden

New York, New York

Conservation Family

I am very glad to accept the invitation to become a member of The American Forestry Association. My reasons for being glad are:

First, my father, W. P. Allen, was a lumberman in the early days in Minnesota. Because of his desire to conserve the forests and prevent the terrible forest fires prevalent in those days, he ran for and was elected a Minnesota senator from his district—including a large section of the counties in northeastern Minnesota. During his term of office he was the author of several bills for forest preservation and fire prevention—all of which became law in Minnesota.

Secondly, in my early married life I lived in North Dakota and took an active part, as did members of my family, in developing forestry programs for that state which were mainly, of course, for windbreaks.

Now, living again in Minnesota, I am actively interested in the work being done by the University of Minnesota and at the Cloquet Experimental Forest.

Mrs. Frances Allen Swinton
Minneapolis, Minnesota

They Belong to You, Mr. Citizen

My student allowance from the G.I. Bill does not leave my wife and me much for recreation but we do contrive to visit several ski slopes every season. Consequently we were interested in the article "Skiing For Everybody" appearing in your January issue. We agree that such weekends can be managed at a very reasonable figure.

AUTHORS

ROBSON BLACK (*Village of Lonely Loggers*) is president of the Canadian Forestry Association, now touring Europe. **W. J. DUCHAINE** (*Tree Planting Machines*), writer and newspaperman, headquarters in Escanaba, Michigan. **GEORGE M. HANSEN** (*Forest Genetics Come of Age*) is a Portland, Oregon, writer. **M. A. HUBERMAN** (*Forests in Ferment*) is forester for United Nations' Food and Agriculture Organization. **MERLIN K. POTTS** (*Mount Rainier Has a Birthday*) is attached to the staff of Mount Rainier National Park, Washington.

However, we wonder if the Forest Service is doing as good a job as it might. We have noted several slipshod things, such as poor toilet facilities, that make us wonder if the foresters are well-trained for this type of work. Wouldn't there be far greater efficiency if some of these skiing areas were turned over completely to private development firms?

William H. Murrow
Berkeley, California

Taking Issue With the Chief Forester

After careful perusal of the article, "Watts Reports on the National Forests," in the February issue, I have come to the conclusion that the same is practically a repetition of the usual gloomy and bureaucratic outlook by the Forest Service of private and state ownership of timberlands.

I object decidedly to the statement, "According to Forest Service estimates . . . only eight percent of all timber cutting practices on private lands are good or better. Twenty-eight percent are fair. Sixty-four percent are poor or destructive." I not only object to these statements, but challenge the truth of them. For your information, I am a graduate forester of about forty years' woods experience and know something about the logging in the Lake States and the South. Without being technical, I feel that Watts is simply talking through his hat when he quotes percentages as stated.

Furthermore, I also challenge the following statement: "Mr. Watts claims that private forest land resources as a whole are on the downgrade, that timber is not being grown as fast as it is being used."

There is more timber growing in the Upper Peninsula of Michigan today than there was forty years ago, and if it had not been for numerous fires, primarily caused by railroads, the stand of timber in the Upper Peninsula would have been at least 100 percent greater than it is now. In spite of these destructive fires, the stand is excellent. Of course, with the intensive modern industrial pace, we cannot wait 250 years to get back trees of the size in the virgin forests. But this is not necessary. Through technical developments we do not have to wait that long to develop trees suitable for forest products.

While Mr. Watts is continually harping on the alleged deplorable state of privately-owned timberlands, it wouldn't be a bad idea if the federal Forest Service put its own house in order, and the "reformers" advocated closer cooperation by the Forest Service and other branches of the government controlling timberlands and reclamation projects.

The substance of all these so-called "conservative measures" is that the Forest Service together with certain elements in the Department of Agriculture still are Wallace-tainted.

Walter A. Henze,
Consulting Forester
Iron Mountain, Michigan

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WASHINGTON LOOKOUT

By A. G. HALL

Supporters of cooperative forestry legislation and appropriations turned out en masse for hearings on H.R. 2296 and the forestry budget.

Judging from the attitude and expressed interest of both the subcommittees—Agriculture and Appropriations—it can be anticipated that H.R. 2296, to amend the Clarke-McNary Act, will be favorably reported and that funds for cooperative forest fire control, reforestation and aids to small owners will be generously provided.

Prior to the hearings on H.R. 2296, state foresters and extension leaders agreed to strike out the request for \$10,000 in unmatched funds for extension work in each state (see March issue). Chief dissenting voice in the otherwise favorable testimony on the Clarke-McNary amendments was that of Richard A. Colgan, of National Lumber Manufacturers' Association. While indicating that he was in favor of the principle of federal-state cooperation in fire control along the pattern of the Clarke-McNary Act, he felt that the sums of money involved in the authorizations had not been adequately considered. He requested, and was granted, time to poll the regional lumber associations to learn their reactions to the proposed legislation.

The forest survey bill, H.R. 2001, likewise was considered by the House subcommittee on Agriculture. A favorable report is expected. In the meantime, a similar bill, S. 979, introduced by Senator Thye of Minnesota, has been reported without amendment by the Senate Committee on Agriculture. These bills provide for an authorization of \$1,000,000 annually to complete the initial survey of forest resources and \$1,500,000 to keep survey figures up to date.

Reforestation and revegetation of national forest lands will be given a tremendous push, if Senate Joint Resolution 53, introduced by Senator Anderson of New Mexico, and former Secretary of Agriculture, is enacted into law. It provides for \$3,000,000 for reforestation and \$1,500,000 for revegetation during Fiscal Year 1951. These funds would be increased by 1955 to \$10,000,000 for reforestation and \$3,000,000 for re-

vegetation, with a like amount being authorized for each subsequent year until 1965. Purpose is to reforest 4,000,000 acres of denuded and unsatisfactorily stocked timberlands and revegetate 4,000,000 acres of seriously depleted range lands. The resolution has been favorably reported by the Senate Committee on Agriculture and Forestry.

The fire-conscious South, through Representative Beckworth of Texas, is making an appeal for additional fire control funds. His bill, H.R. 2860, would authorize, in addition to other amounts for forest fire control, \$5,300,000 to be spent in the states within the southern region of the U. S. Forest Service.

A Water Pollution Control Advisory Board, as provided in Public Law 845 of the 80th Congress, has been appointed by President Truman. Chairman of the board is Mark D. Hollis, assistant Surgeon General in the Public Health Service. The board consists of eleven members, six of them "public members," and the others are specified in the Act as representatives of federal agencies concerned with pollution problems. This is the first step under the Taft-Barkley Act.

The public lands are safe from land-grab actions by the western stockmen, according to William Voigt of the Izaac Walton League, but all public lands, and especially those under the jurisdiction of the U. S. Forest Service, are being placed in jeopardy by "sniping tactics." Speaking before the Fourteenth North American Wildlife Conference, Voigt urged conservationists everywhere to be alert to efforts to undermine the Forest Service—these he indicated are, in effect, steps toward eventual private control of public lands.

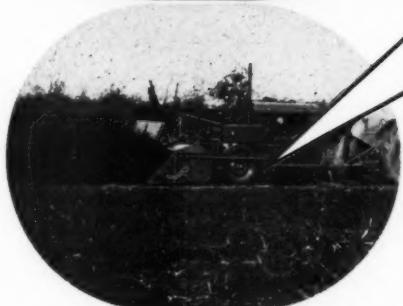
Flood hazard may be one of the aftermaths of the widespread heavy snowfall in the western states. Snow surveys show that water content on the major watersheds is about 200 percent above normal in the Columbia River Basin; 150 percent above normal on the headwaters of the Missouri River; 175 percent in the Great Basin and the Upper Colorado.

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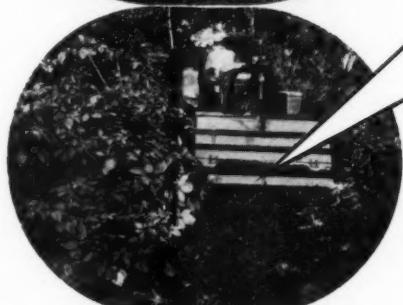
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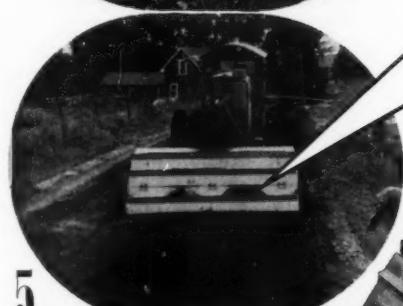
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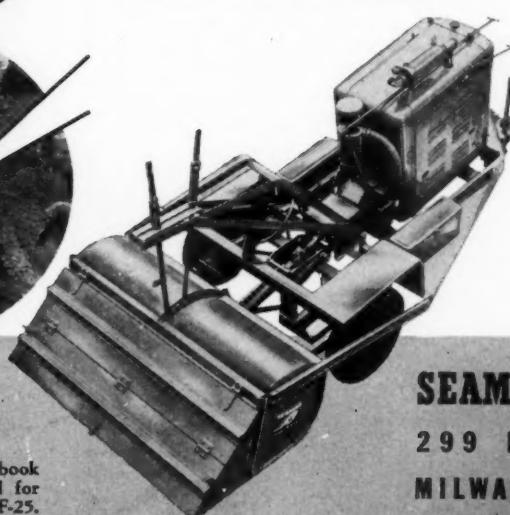
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WESTERNERS could scarcely recall a more pleasant autumn. On the high plains the cattle and sheep had grown fat in days that were a succession of mildness. With a soft Indian summer haze lingering over the range, who would have dreamed that in the space of a few weeks this vast area, from Montana to New Mexico, would be bludgeoned by the most savage blizzard in western history?

It came without warning—a nightmare of ice-sheathed death that belted ten western states with eight consecutive storms throughout January and February. At least fifty people perished. Some died trying to save their stock. Others traveling by car or truck on lonely secondary roads were locked in by drifts and froze to death.

Approximately 81,000 cattle and 97,000 sheep were wiped out in

By JAMES B. CRAIG

Utah, Nevada, Wyoming and Colorado in January, the Department of Agriculture reported. Heaviest stock losses were in the initial phases of the storm when entire herds perished. The death toll continues to mount as returns come in from other stricken



states. Stockmen anticipate heavy lambing and calving losses. With much predicated on general conditions the next few weeks, it is difficult to make loss estimates. But guesses range from three to ten percent of three million steers and as many sheep. With stock totals already at the lowest ebb since the Civil War, steak tressermen will undoubtedly feel the pinch by 1950.

Wildlife suffered, too. Experts were impressed anew with the importance of establishing a clear-cut range policy to hold wild game numbers to what the range will actually support. If man doesn't regulate game, nature will—and in her own merciless manner. Airlift hay proved no fit diet for deer. It bloats the animals' stomachs and in time will kill them. Deer require natural forage and that was why hundreds of the animals forsook their normal feeding areas and ap-

Planes and bulldozers spearheaded and won the rangeland's most dramatic battle against the elements—saving hundreds of lives and thousands of animals. Now haggard westerners are confronted by a new menace—the threat of spring floods of epic proportions

Nebraska had a mere seventy-one-inch snowfall compared to an unprecedented 300 in Utah and 134 in Montana. Will the watersheds be able to absorb this tremendous load? Only time will tell.

But what of the background leading up to the blizzards of '49?

To stockmen basking in 1st October's sunshine the future had looked particularly rosy. Top beef was bringing an all-time high of thirty cents a pound compared to sixteen when OPA was lifted. Sheepmen were finding their own profits equally agreeable. There was money in the banks for new cars, new household appliances and winter vacations from drudgery. There was collateral aplenty for herd improvement. Times were good and, seemingly, there was little to worry about.

But were there any danger signals—any chinks in the age-old armor of the West against the elements? Some say yes, pointing to the fact that considerably less hay was cut in 1948 than the average for the previous ten-year period. Some stockmen, who should have known better, failed to cache ample supplies of hay

and cottonseed cake at strategic points. Then too, some old-timers took a dim view of the newborn day-to-day dependence on long supply lines to the nearest shopping center for the liquid fuels and even food supplies required to operate a modern ranch. These cautious ones looked to their sleds and their horses, their woodpiles and their chunk stoves, toted in barrels of flour, smoked meat and exhorted their womenfolk forward to greater canning endeavors.

It was one such canny oldster who later flagged down a ski-plane after being marooned for three weeks and outraged the weary pilot by remarking pleasantly, "I'm all set for vittles son, but I'm plum out of chawin' tobacco."

But that's not the whole story. Ironically enough, some of those who prepared the most were hit the hardest.

Pat Flannery, Goshen County, Wyoming, rancher and Senator Joseph O'Mahoney's assistant in Washington, had a word for it. It was "luck."

"When Old Man Weather is toss-

Where motor transport couldn't get through planes did. This C-47 pinpointed a stranded Nebraska herd and bombed it with hay bales

Bureau of Reclamation Photos

peared on the main streets of western communities to nibble at choice shrubbery and plants. After eating one man's prize shrubs in Salt Lake City, a deer added insult to injury by camping out on his front porch. Adopted by neighboring children, this animal's fate was far happier than that of a Wyoming elk found dead leaning against a signboard proclaiming the virtues of "Beautiful Wyoming."

Now blizzard-beaten westerners are confronted by a new hazard. Hard winters are harbingers of floods. And with snowfall forty percent above normal this danger must be reckoned with. Already churning snow waters from the Big Horn, Powder and Yellowstone rivers are smashing into the swollen Missouri. One Nebraska scientist computed that the state's snow cover would melt down into nearly four trillion gallons of water. And



ing tons and tons of snow around like sofa pillows, the only thing to do is pray," Flannery said devoutly. "I was lucky. But ranchers who prepared for winter just as diligently as I did weren't. Anything can happen in a storm like that."

Congressman Frank Barrett, Wyoming sheep rancher, concurred with Flannery regarding the luck element. He told of one instance where sheepmen drove several bands to a shed by almost superhuman endurance only to find the entrance blocked by a

stockmen paced from room to room while their wives went about their tasks in tight-lipped silence.

For the stock it was murder. Beleaguered animals turned tail to the waves of snow and wind that sucked the breath from their bodies and drifted aimlessly with the storm. Some animals floundered into coulees and were buried alive. Others wandered over canyon precipices. Thousands of head of cattle, no one knows exactly how many, perished that terrible first day. Full losses will not be

homes like moles to face a silent ocean of white.

Clyde Hatch, Simpson Springs, Utah, sheepman, finally found 15,000 head of sheep deep in the Dugout area after a search of a day and a half. Some stood frozen in their tracks—an immobile army of rigid sentinels staring sightlessly to the south. Others lay huddled together in death as though for one final sleep. The living required Hatch's full attention, but in a little while he too passed out from exhaustion and was rescued by a neighbor.

Sheepherder Allan MacKrell tumbled into a canyon and was swallowed up in forty feet of snow while attempting to turn back sheep that had wandered from the corral of Otto J. Wolff at the height of the storm. Wolff, a Rapid City, South Dakota, stockman, found one of MacKrell's shoes a day or two later. His body wasn't recovered from its tomb of snow until February 28. Ninety-two sheep perished with the herder.

Trees played an important part in saving 300 weened calves owned by Jules Sandoz, of Ellsworth, Nebraska, and son of the central protagonist of the celebrated novel *Old Jules*. When the storm struck, Sandoz crowded his young stock into a five-acre patch of willows where he and the calves sat it out in safety. In fact, there is evidence that trees played a major role in protecting both stock and animals from the elements. Mercy flight aviators reported seeing many bunches of cattle taking advantage of this type of shelter.

W. D. Edmondson, Wyoming extension forester, reported that shelter-



Bureau of Reclamation Photo

The white smother took an exacting toll of western wildlife

mountainous drift of snow that would have required a bulldozer hours to move. He told stories of the quixotic nature of the storm—how the wind flipped carloads of snow from ranch to ranch, baring the ground in some instances and then driving it all back later on. Stock cornered and caught in such avalanches didn't have much chance.

It all started placidly enough. January 1 began as an ordinary kind of day. Later the barometer began to fall. An angry purplish hue appeared on the northwestern horizon and temperatures skidded to below zero. It began to snow late in the afternoon. Simultaneously the wind started to whine down ranch house chimneys, developed rapidly from an angry murmur to a stinging gale.

By January 2 ten western states were caught in the grip of a choking smother. Blinding curtains of snow were driven pell-mell across the land by sixty- and seventy-mile winds. The cold was deadening. Indians in bleak hogans piled into their bunks and buried themselves under mountains of bedclothes. In ranch houses

known until warming chinook winds or spring rains fold back the white blankets of snow to reveal their toll.

The storm attained new momentum on the third, continued on the fourth. Life came to a halt in much of the West. Then it slacked off and westerners came burrowing out of their



Sheep perished in the midst of plenty due to the deadening cold

belts of three to five rows of trees, at least 100 feet from farm homes and outhouses, generally took the brunt of the drifts keeping the barn lots and open sheds clear. In some cases snow piled up to a height of fifty feet on the lee side of the strips. Shelterbelts also afforded protection to stock and wildlife causing Forester Edmondson to comment, "We can see now the folly of not having trees in the farm and ranch layout."

John F. Keller, Cherry Valley, Nebraska, rancher, warmly endorsed Edmondson's views, declaring, "The sad experience of this winter woke up many stockmen to the fact they must have more and better shelter for their stock or quit the business."

With thousands of miles of roads blocked by drifts, families in need of aid and cattle and sheep in dire straits, westerners reacted with characteristic vigor. Red Cross chapters were alerted in Kansas, Nebraska, South Dakota, Wyoming, Colorado and New Mexico. State and county highway departments doubled and trebled their crews. Government agencies, including the Bureau of Land Management and the National Park Service of the Department of the Interior, and the Forest Service of the Department of Agriculture, unhesitatingly threw their equipment and resources into the breach, unmindful of the fact that no funds had been appropriated for such a purpose.

But the end was not yet. In those first deadly weeks of 1949 the West was lashed by no less than eight major blizzards. Costs were staggering and state resources gradually dwindled. This was particularly true as regards snow removal operations.

The state of Nebraska, for example, had 281 pieces of snow removal equipment under contract in January, mostly bulldozers. At a minimum rate of \$12 an hour, it costs approximately \$216 to operate a single machine on an eighteen-hour-a-day basis. With this equipment working practically around the clock, the state was spending in the neighborhood of \$60,000 a day, or \$1,800,000 for a thirty-day period. Such staggering costs, and others like them, soon had state budgets reeling. Westerners had every intention of taking care of their own but there was a limit both to financial and physical resources.

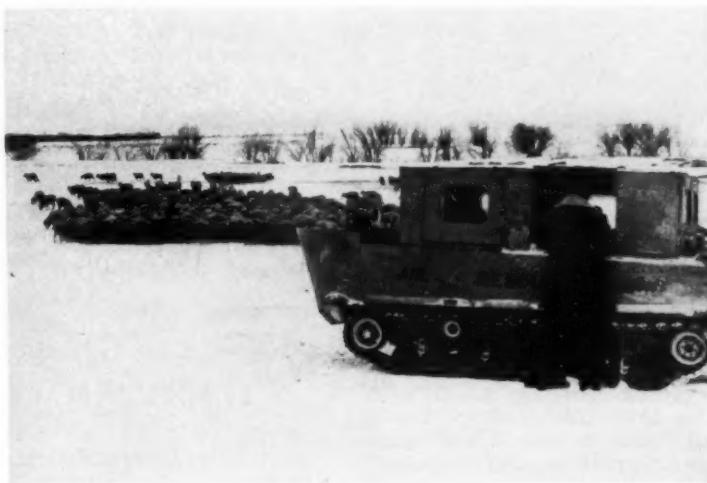
Back in Washington the nation's capital was readying itself for the pomp of a presidential inauguration. Despite the holiday air that pervaded the city there were those, from the President down, who were keeping

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Wide World Photos, Inc.

Rounding up snowbound strays kept cowboys busy near Lund, Nevada



U. S. Air Corps Photos

A feed-laden weasel smashed through drifts to reach this herd



Door to door deliveries of coal and food were made in marooned areas



A portion of a new village for forest workers at Villingsberg, Sweden

Village For Lonely Loggers

Swedish lumberjacks like city life—they'll take a bungalow to a bunkhouse any day. As a compromise, state and industry are providing modern logging villages

SINCE standing timber can't move closer to the towns, what's to be done with woods-men who won't live near the timber? Sweden is undergoing one of her most baffling trials and with characteristic adaptability is trying to work out a temporary salvation by the building of forest villages.

It may seem odd that a land-loving, work-loving people such as the Swedes should, of a sudden, develop a positive distaste for isolation. Yet such is the case, as any woodsman will dolefully inform you. It is explained, in part, by the rapidity of Sweden's industrialization as a result of which seventy percent of the people owe their jobs to factory employment. Only three of ten families remain on farms or in the cottages of forest workers.

In the middle-sized towns, such as Sandviken, scene of a great steel works, enormous and beautifully-equipped recreation buildings provide a playground for men and women such as no country district can emulate. Motion picture theaters blaze with color and light. Shopping

By ROBSON BLACK

streets bring the world's luxuries to the buyer's hand. Nor is it hard, in the prevailing scarcity of labor, to get jobs in such places, and not too difficult to rent one of the company's self-contained flats, centrally heated, with electric stoves and other house-keeping aids, and a children's nursery for each apartment block, with a competent nurse in charge. Small wonder that the young Swede and his wife, living up-country in the heart of the bush, look with envy at life in the industrial towns—and one day draft a letter of application.

But the last thing Sweden can afford is to depopulate her domain of forest and farm. Every acre of arable soil must be kept fruitful; every acre of timber must furnish its quota of logs to the forest industries, for their stability constitutes the national life-line of employment and export. To sustain a raw material supply for forest industry requires a localized labor force of 200 thousand men, half of whom work full time in the

woods, the others tend their small farms and take jobs as cutters and haulers for part of the year. If for any reason this army of supply decided to transfer to the factory towns, no worse blow could be dealt to the national economy.

Both the state, which is a large forest owner and employer, and the wood-using corporations decided a few years back to meet the crisis before migration set in too strongly. They believed that the isolated rural family would accept a compromise between the lonely hillside and the populous industrial center. And that





Pure pine stands like this one owned by the Uddeholms Company adjoin the new Swedish villages built for loggers

is how the planned villages got under way.

Does a new-born Swedish village pay its way? By no means. The writer recently spent a day in and about the picturesque group of workers' homes at Villingsberg, set up by the state forestry department to insure a permanent labor force. The average annual income of employees is about \$1,150 and their annual rent payment is just \$80. This amount is presumed to be all the householder can afford, but the state is obliged to shoulder \$400 a year to meet the costs of each village dwelling. It becomes, therefore, a bonus proposition and is looked upon as the only possible method of holding men and families in the region where their services are required.

At Villingsberg, it costs the state between \$7,000 and \$8,000 to erect each two- or three-family unit. This may sound extreme, but building costs in Sweden have risen fantastically. The three or four rooms allocated to each family are amply large. Floors are covered with heavy linoleum in attractive patterns, the

walls are well insulated and enamelled in pastel shades. In the kitchens are stainless steel sinks and drainboards, electric stove and wood stove, an abundance of cupboards and, of course, running water.

Perhaps the most pleasant of all impressions was the immaculate condition of the rooms and furnishings, a tribute to the common standard of Scandinavian housekeeping. Incidentally, the cost of running an electric cookstove in Sweden works out at two and eight-tenths cents a kilowatt hour, virtually identical with the cost of wood-burning in a country owning almost no coal. The price of fuel-wood, delivered in towns, runs to \$18 or better a cord.

What of those large Swedish corporations that must retain thousands of families in their timberlands or go bankrupt? Consider the case of the Uddeholms Company, founded 281 years ago, the owner of 700 thousand acres of meticulously-managed timber and a large buyer of wood on the open market. This company, too, is gradually transferring its married woods workers into vil-

lage communities, and putting up super camps for its single men. On maintenance of workers' homes, and payment of interest charges on its housing investment (apart from any camps), Uddeholms spent \$500,000 last year as against \$100,000 received as rentals.

I visited a worker's dwelling to which was attached twelve acres of land, with stable and shed, and for this equipment he pays \$112 a year. This means that Uddeholms foots a supplementary annual bill of \$560. Worked out another way, the wages paid to this particular employee are \$4.80 a day, covering 100 to 150 days a year, and it costs the company approximately another \$4.80 a day for the house and farm.

Obviously, these high supplementary expenses in holding a worker to a convenient location must be added to the cost of industrial production. With the farmers' unions able to demand \$25 a cord, delivered at roadside, and with the weight of company subventions in providing living-quar-

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CONSERVATION AND THE HOOVER REPORT

An analysis of proposals to consolidate forest and range management in the Department of Agriculture

By G. H. COLLINGWOOD

In its report to Congress on "Reorganization of the Department of Agriculture," the Hoover Commission has proposed that the Office of Land Management in the Department of the Interior be merged with the Forest Service, creating a new bureau to administer most of the public domain, including the controversial Oregon and California vested lands in western Oregon, and the national forests. This is in line with the commission's No. 1 proposal for "an extension of the functional organization of the department and a better grouping of activities related to the same major purpose."

The commission placed the new bureau in Agriculture only after long and thoughtful consideration, and with full recognition of conflicting views which favored its placement in a Department of Natural Resources, presumably to take the place of the present Department of the Interior. In its report to Congress the commission stated: "This commission believes that logic and public policy require that major land agencies be grouped in the Department of Agriculture. It recommends that the land activities of the Department of the Interior, chiefly the public domain (except mineral questions) and the Oregon and California vested lands be transferred to the Department of Agriculture and that the water-development activities (except the local farm supply of water) be transferred to the Department of the Interior."

This follows the recommendations of the commission's task force on agricultural activities rather than those of its task force on natural resources. And since each of the task force committees was comprised of leaders with a broad understanding of the country's land problems, it should be enlightening to review some of the viewpoints of each committee, particularly the line of reasoning which motivated the task force on agricultural activities.

All three of the task force commit-



tees—agricultural activities, natural resources, and public works—concurred in the desire to correct the present duplication in government organization as it relates to the management of forest and range lands on the public domain. Each would combine in one departmental organization the management of the national forests, grazing on the public domain, the Oregon and California vested lands, and fish and wildlife. Accordingly, the commission recommended as follows: "Our three task forces on agriculture, natural resources, and public works all urgently recommend the consolidation of these agencies. It has been urged for many years by students of government. The commission agrees with this recommendation."

The task force committees differed as to what should be included within the administrative units or bureaus, and more fundamentally, as to

THE AUTHOR, former Forester for The American Forestry Association, served with the Hoover Commission as research director for the Task Force on Agricultural Activities.

the executive department in which the bureaus should be located. The committee on natural resources favored a Department of Natural Resources, which would replace the present Department of the Interior. The committee on agricultural activities would place the "Forest and Range Service" in a reorganized and functionalized Department of Agriculture.

The agriculture committee based its recommendation upon the fact that trees and grass are crops, that livestock which feeds on the grass is a crop, and that the growing of trees and grasses on the public domain is essentially similar to the growing of these and other crops on privately owned farm lands. Problems of assuring future timber supplies for the nation, of river management and flood control, of the maintenance of inland and anadromous fish, fur-bearing animals and other wildlife reach deeply into public domain as well as farm and ranch lands. To avoid the weakness resulting from separation, the committee concluded that public timber and grass producing lands can be most successfully administered in the same department that deals with research in the growth, protection, utilization, and disposal of other crops.

The problem was reduced to its simplest terms by the committee. The federal government was compared to an individual landowner, and the question was asked—"How would the individual landowner, say of 640 acres, handle his administrative problems?"

Admittedly, he would administer cultivated lands, pasture lands and woodlands all as one unit, but in varying degrees of intensity. It is doubtful if he would transfer ownership of any portion of his holdings, though he might designate responsibility of the various types of land to specially trained or equipped hired men or supervisors.

Carrying this comparison back to the federal government with its mil-

lions of acres of publicly-owned lands, the Hoover Commission evidently agreed with its committee on agriculture that all the administrative responsibilities should be combined and coordinated within the Department of Agriculture. The administration of the "back forties," so to speak, which could be compared to the national forests, would be combined with the open pasture lands and other "back forties" known as the Oregon and California revested lands.

It also might be said that the combination and division of responsibility as conceived by the task force on agriculture and accepted by the commission, is an attempt to correct the relatively complete and autonomous character of the Forest Service as a bureau within the Department of Agriculture. As a result of fifty years of somewhat haphazard overall administration, the Forest Service not only administers national forests, cooperates with and stimulates the administrators of state properties, but extends its influence to all forest owners.

To more adequately service its land administrative responsibilities and those of the states and private owners, the Forest Service has established independent channels in the development of research. Twelve regional forest experiment stations and the Forest Products Laboratory at Madison, Wisconsin, are all administratively responsible to the Forest Service—and until the Agricultural Research Administration was set up the Service gave comparatively little regard to comparable research activities in other bureaus of the Department of Agriculture.

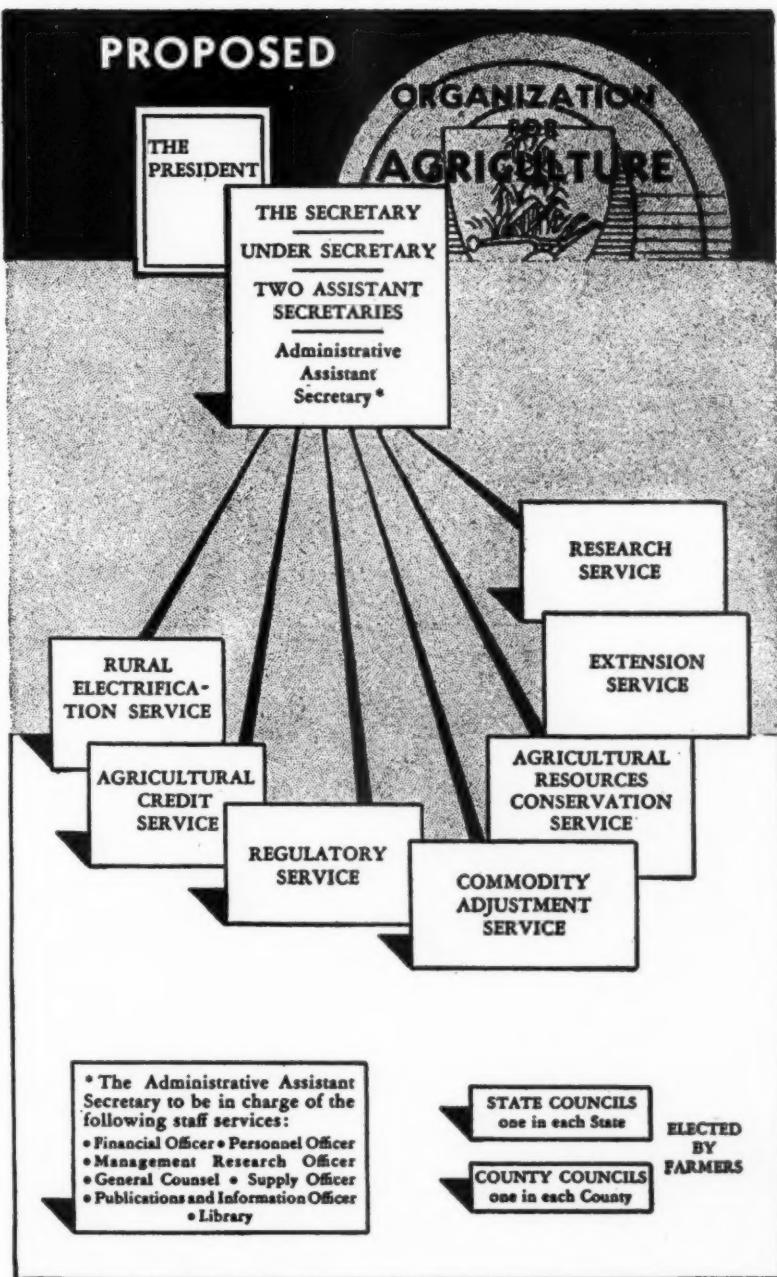
Thus in the matter of the administrative location of research as applied to forests, grazing lands and livestock, the answer seemed simple to members of the agricultural task force. Trees are plants, subject to essentially the same laws that govern the growth of orchard trees and annual crops such as potatoes and wheat. Grass and forage crops are only a few steps removed from plowed land crops. And range cattle are subject to the same diseases as milk cows. Therefore, research in the care and management of forests, rangelands and range livestock could logically be administered in the same research service that handles orchard crops, annual crops and barnyard cows. The specialists within the Agricultural Research Administration who study these crops would serve shoulder-to-shoulder with other scientists who work on annual crops and do-

mesticated animals. They would not be the same scientists, but their interests would be tied closely to the forest and range.

The agricultural task force hoped and believed this would bring the forest and range research program more closely in touch with the state and federally-supported experiment stations attached to the land-grant colleges. If carried out by Congress, it may place the Forest Products Laboratory under general overall administration with the four regional agricultural laboratories near Philadel-

phia, New Orleans, Peoria and San Francisco. All are devoted to basic problems incident to the utilization of crops which grow from the land. By combining their administration, economies can be effected, duplication eliminated and new ideas stimulated for use and development of various crops.

In its recommendation grouping operational functions of the Department of Agriculture into eight major units (see chart below), the Hoover Commission proposed that basic sci-
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Mount Rainier

Has a Birthday

By MERLIN K. POTTS

For fifty years the people of America have been enjoying this majestic mountain as a National Park. But the task of preserving its rugged beauty hasn't always been easy



Thousands of visitors drive to Paradise Valley on mid-summer afternoons



Mount Rainier National Park, established to preserve and protect the most majestic mountain in the United States, celebrated its Golden Anniversary on March 2. Through fifty years of conservation, beginning in 1899, the maintenance of one of America's superlative scenic areas in its original natural beauty has been an incessant and, at times, a bitter struggle.

The way of the conservationist has never been smooth. To many his aims are idealistic, a barrier to progress; he must continually endeavor to enlist understanding and sympathy in his cause, which, in the final analysis, is the cause of the American people themselves. A strange paradox it is that those who stand to benefit most are oftentimes aligned with the strongest opposition.



Logging operations are in progress within a quarter mile of the northern, western and southern boundaries of Mount Rainier National Park. Within a few years the park is likely to be an oasis in an area of cutover lands

At the turn of the century, American thinking was a long way behind today's conception of conservation. There were those, of course, who had begun to decry the prodigal waste of natural resources and the old theory of inexhaustibility was no longer universally accepted. But the voices crying in the wilderness were for the most part unheard or unheeded.

However, in 1894, a concerted movement toward the establishment of Mount Rainier National Park in Washington was originated by the combined efforts of the National Geographic Society, the American Association for the Advancement of Science, the Geographical Society of America, the Sierra Club and the Appalachian Mountain Club. Senator Watson Squire, of Washington, intro-

duced a bill proposing its creation, and this was enacted in 1899.

No provision for the administration of the national park, the fifth to be created, was made, and from 1899 to 1910 Supervisor Grenville Allen, of the Rainier National Forest, served as acting superintendent. In January 1910, E. S. Hall, now serving as U. S. Commissioner in the park, was appointed as its superintendent.

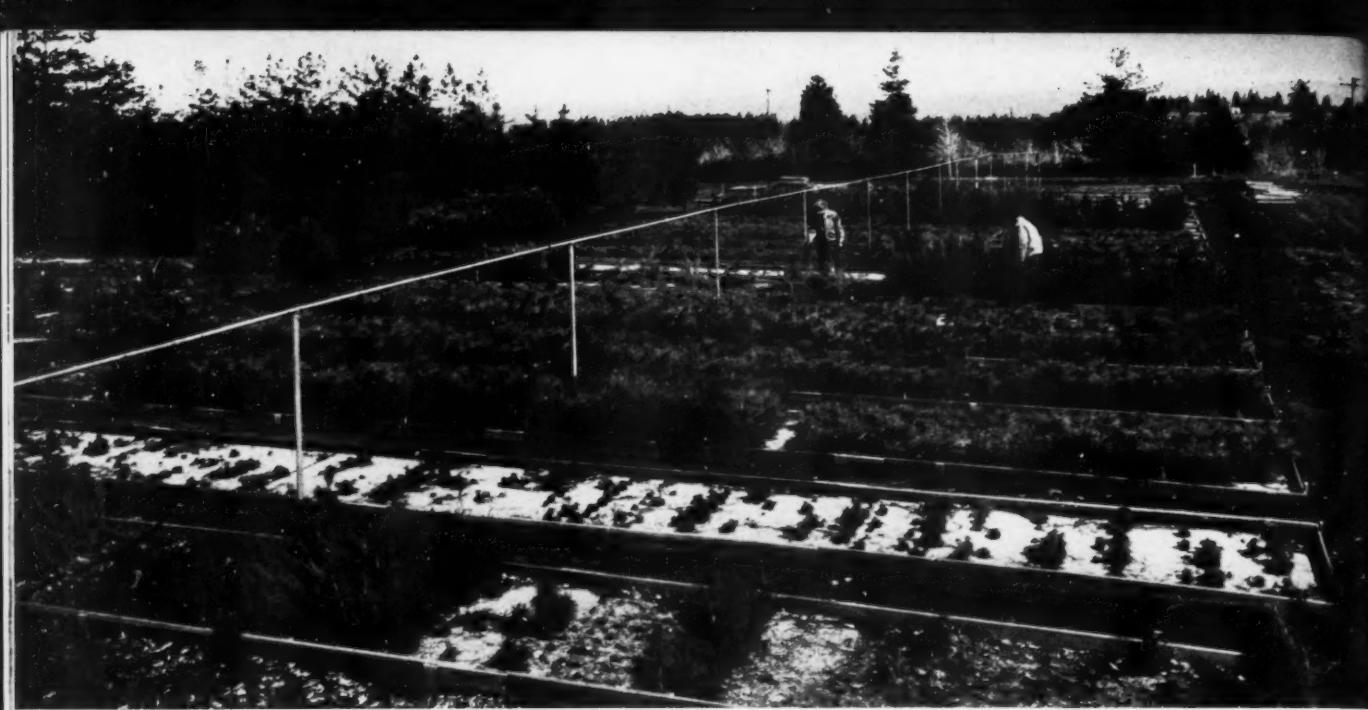
Although several national parks were in existence prior to the act establishing a National Park Service in 1916, it was then that a basis for the policy now employed in administering these areas came into being. The act provided for the protection and preservation of a few remnants of the remaining unexploited areas of the country, in order that these natu-

ral wonders which are so vital a part of the American heritage might not be irretrievably damaged.

It would seem that the lessons taught by earlier disastrous destruction would have provided for ready

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Nursery at Institute of Forest Genetics where new hybrid forest trees are compared with ordinary seedlings

Forest Genetics Comes of Age

By GEORGE M. HANSEN

A new science moves into the field of mature accomplishment. The Institute of Forest Genetics, established in California nearly a quarter century ago, is now producing faster growing and hardier hybrid pines for forest planting

THE science of forest genetics has moved from the pioneering stage into the field of mature accomplishment. And the acknowledged leader in this work is the Institute of Forest Genetics at Placerville, California.

Now in its third decade of genetics research, the institute has been instrumental in bringing the hybridization of forest trees to about the same stage that hybridization of corn had reached in the mid-twenties. This progress is incentive enough for greatly expanded future studies.

In 1925 James G. Eddy, a lumberman of Medina, Washington, established near Placerville the Eddy Tree Breeding Station. With his knowledge of the practical aspects inspired by Luther Burbank's achievements in plant breeding, he was convinced of the necessity for improving forest trees.

During the first few years, the work was directed by a board of trus-

tees, national in representation, and financed by generous gifts from Mr. Eddy and his brother. The station was renamed the Institute of Forest Genetics and, since 1935, has been administered by the United States Forest Service.

It was not by chance that the 106-acre institute was located at an elevation of 2,700 feet in the Sierra Nevada foothills near Placerville. After careful investigation, this site was found to have a preponderance of favorable natural conditions for tree-breeding experiments. Moderate climate, deep loam, favorable topography, and a plentiful supply of water are all combined in the site. It was found also that this lower elevation of the mountain slopes had produced the fastest growing strains of the predominant ponderosa pine.

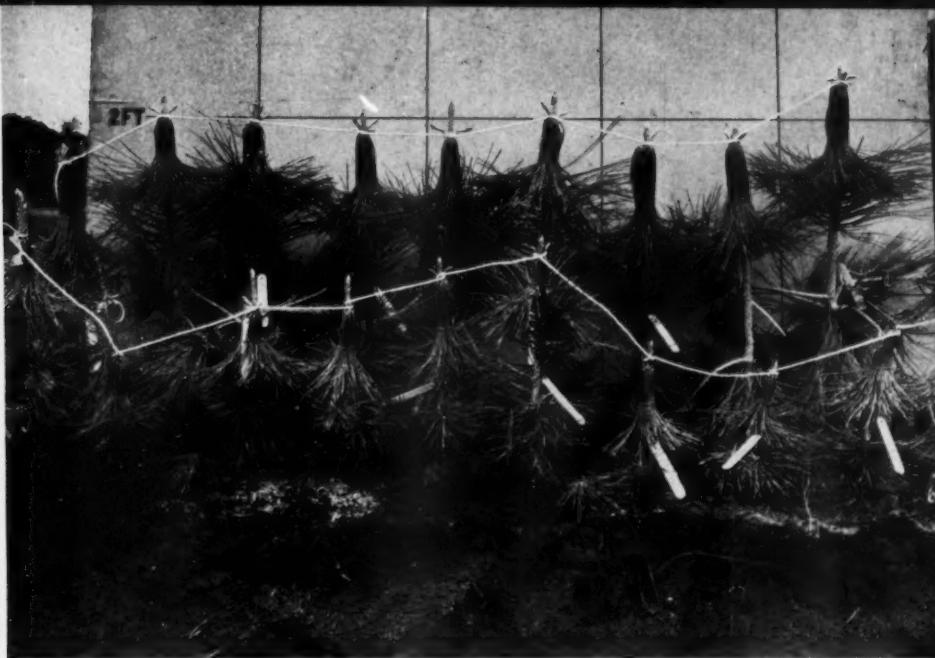
In order to better unify its work, the institute has confined its activities to pines among the softwoods and black walnut among the hardwoods.

Being in the center of a great ponderosa pine region, it followed that much of the breeding has been with this species. California was a logical state for the experiments with the many species of pine since it has more species of native pines within its borders than any other comparable area in the world. In addition to hybridization, the institute is doing genetics research by cuttings, graftings and studies in seed variation, pollen storage and effects of elevation.

The arboretum at the institute is remarkable in that it contains the world's most complete collection of pines. There are eighty-five known species of pine in the world, and the institute now has seventy of these, plus twenty-two varieties and twenty-six hybrids. Forty countries have sent seed of their native pines. Most species are represented by trees grown from seed collected at five or six different localities within the spe-



Bag and syringe protect pollination



Jeffrey-Coulter hybrid pines (rear) grow faster than Jeffrey pines (front)

cies' natural range. Other trees under observation in the arboretum include thirty-five species of conifers, representing seventeen genera, and twenty species of hardwoods, representing thirteen genera.

A list of hybrid pines cultured at the institute is too long to present here. It includes, for example, crosses between knobcone and Monterey pines; between ponderosa and Arizona, Jeffrey and Apache pines; between Western white and Eastern white pines, and between both Western and Eastern white and Himalayan pine; between loblolly and slash, longleaf, shortleaf and pond pines; and between longleaf and slash pines.

The first work undertaken was directed at determining which species was the fastest growing. Every effort was made to have the environmental conditions uniform throughout the experiment. Seed of each species was planted in several plots in various parts of the nursery. Annual height, diameter and branch growth were carefully recorded. After two years in the nursery, the "vigorous" and "normal" trees of each species were selected and transplanted to the arboretum where comparative measurements have been continued.

To date, the fastest growing natural pine in the arboretum has been the Monterey pine of California, followed by Mexican spreading-leaved

pine, French cluster pine, Italian stone pine, slash and loblolly pines of the South, and the Coulter pine of southern California.

After determining the fastest growing species, the next step was to discover inherent variations within important species. Seedlings raised from seed collected in various known regions within the species' natural range were compared.

Since 1927, these seedling or progeny tests have been undertaken with many species and varieties of pines grown from carefully identified seed. The seed has been gathered from several thousand trees, for each of which the location has been mapped in one of hundreds of field plots. The progeny test of ponderosa pine used seed gathered from trees in sixty counties of twelve western states and British Columbia, and included habitants of every 500 feet of elevation.

The tests have demonstrated that local strains exist within a species and that even individual trees in one locality may vary greatly. The fact that progeny of certain individual trees grow so much more rapidly than is to be expected suggests the feasibility of establishing a plantation of rapid-growing strains, away from dangers of pollination by inferior trees, solely for the purpose of producing seed for future reforestation programs.

Having brought out better qualities in natural trees, the next work of the institute was to "create"

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The Institute of Forest Genetics administration building



A tree planting ceremony on the school ground is the most widespread of all Arbor Day observances. Here the children of Cherry Hill School in Washington, Ohio, gather around as a classmate plants a dogwood

ARBOR DAY 1949

By NORT BASER

Remember those tree planting holidays when the kids in the old red school house really had green thumbs? Here an *American Forests* editor views Arbor Day 1949, and concludes it's still a great day for the trees

"OTHER holidays repose upon the past; Arbor Day, proposes for the future."

These words are inscribed at Arbor Lodge, Nebraska City, Nebraska, on the monument erected to the memory of J. Sterling Morton who fostered the first Arbor Day seventy-seven years ago this month.

The planting of a tree very definitely is a symbol of our faith in the future. Whether we plant for beauty or utility, we plant for tomorrow. Whether we plant one or thousands of trees, and assume the responsibility for its or their care, we make a tangible contribution to the future of our community and our nation.

This was the spirit of Arbor Day at its inception more than three quarters of a century ago. Its purpose was to dramatize the need for planting trees, and at the same time to implant the meaning of conservation in the minds of citizens, particularly the youth of the nation. Over the years, it has been one of conservation's most effective mediums of education and enlightenment.

Recently, however, there have been signs that Arbor Day's star was beginning to dim. So *American Forests* launched an investigation—a quick survey of Arbor Day interest and activities throughout the country.



South Carolina's Senator Olin D. Johnston (then governor) planted a cork oak at the state capitol — the first of a series of cork oak Arbor Day plantings



Statewide participation in Arbor Day programs is stimulated in Ohio by the timely and helpful material mailed by the State Conservation Division

What we found is anything but discouraging. In fact, with the exception of apparent apathy in a handful of states, it can be said that the future of Arbor Day in America seems quite secure.

The green thumb for taking the Arbor Day pulse was a questionnaire to foresters and educational leaders in the various states. Response was enthusiastic from at least two-thirds of the states. From these, evidence of activity poured in, not only from originally contacted sources, but from the crossroads and main streets of America and all the way points. From North, South, East and West came voluminous evidence from school children, Future Farmers, 4-H Clubs and Boy and Girl Scout troops, from garden clubs, civic groups, industry, state legislatures and advocates of community, town and school forests.

From the prairies, mountains, lake country, arid desert regions and even heavily forested areas enthusiasm for tree planting oozes like the sap in spring. Countless are the observances at which is planted a single tree, and there are scores of mass forest and watershed planting projects.

George O. White, state forester for Missouri, after describing a representative program of activity, commented: "As our educational facilities expand, we can help make Arbor

Day in Missouri a more important day for the schools."

Roger L. Guernsey, Idaho state forester, outlined a rather complete Arbor Day program for his state. "Much more could be done," he observed, and, as a guide for development, "I would be interested in knowing what other states are doing."

One of the better Arbor Day programs was found in Ohio. There the Department of Education, the Division of Conservation and O. A. Alderman's state forester's office haven't missed a bet. It has been the custom for the past several years for the director of education to recommend to the governor one specific day to be proclaimed as Arbor and Bird Day; one particular week as Conservation Week in Ohio schools and the entire month of April as Conservation Month. (A law is now pending in the state legislature to make the last Friday in April the official Arbor Day.)

Once the date is set, the machinery for a large-scale promotion program is put into motion. Matted pictures, art and feature stories, as well as news items, are furnished all newspapers and publications within the state. A Conservation Week handbook is printed and distributed to teachers and school administrators for use in preparing observance programs. It is informative, attractive



Statue of J. Sterling Morton, founder of Arbor Day, at Nebraska's Arbor Lodge

and very widely used.

The interest aroused is tremendous. The state forester's office at Wooster fans the flame by offering free trees to any school which will plant them as a school forest.

Fully two thirds of our states follow essentially the same pattern with varying degrees of emphasis. New York, Pennsylvania, Florida, Georgia, Missouri, Mississippi, Illinois and Iowa are among the many which issue Arbor Day handbooks, and all do some type of advance publicity.

Quite a few of the states add a different twist as dictated by their special interests and needs. For instance, South Dakota stresses shelterbelt planting and the importance of trees and bird life in a prairie and plains country. In many of the rural schools in Kansas, Arbor Day is celebrated with a community family dinner at the school, at which time the men help the children plant trees and shrubs.

Nebraskans, of course, have been among the leaders in keeping Arbor Day alive through the years. County superintendents of schools are reminded each year to urge their teachers to plan suitable programs. Often counties have responded by holding a countywide observance of Arbor Day during their "Play Day" jamborees.

By virtue of strong State Forest

ARBOR DAY TIME TABLE

State	First Observed	Date Now Observed
Alabama	1887	Usually first or second Friday in December. By proclamation*
Arizona	1890	Friday after first of February. (Friday after first of April in 5 counties)
Arkansas	1906	First Saturday in December
California	1886	March 7
Colorado	1885	Third Friday in April
Connecticut	1886	By Proclamation*
Delaware	1901	By Proclamation*
Dist. of Columbia	1920	Third Friday in April. By Proclamation**
Florida	1886	Third Friday in January
Georgia	1887	Third Friday in February
Idaho	1886	Between April 1—May 1. Set by county school superintendents
Illinois	1887	Usually in April. By Proclamation*
Indiana	1884	Third Friday in April. By Proclamation*
Iowa	1887	Last week in April. By Proclamation*
Kansas	1875	By Proclamation*
Kentucky	1886	By Proclamation*
Louisiana	1888	January
Maine	1887	Set by governor and council (Law pending last Friday in April)
Maryland	1884	March. By Proclamation*
Massachusetts	1886	Last Friday in April. By Proclamation*
Michigan	1885	Late April below Straits. Early May above Straits
Minnesota	1876	By Proclamation*
Mississippi	1890	Friday after first Monday in December
Missouri	1886	Friday after first Tuesday in April.
Montana	1888	Second Tuesday in May.
Nebraska	1872	April 22
Nevada	1887	Last Friday in April
New Hampshire	1885	Late April or May. By Proclamation*
New Jersey	1884	Second Friday in April
New Mexico	1890	Second Friday in March. By Proclamation*
New York	1889	Usually in April. By Proclamation***
North Carolina	1893	Friday after March 15.
North Dakota	1882	First Friday in May
Ohio	1892	April. By Proclamation* (Law pending last Friday in April)
Oklahoma	1898	Friday after second Monday in March
Oregon	1889	Second Friday in April east of Cascades. Second Friday in February west of Cascades.
Pennsylvania	1885	April 9 plus another day in October. By Proclamation*
Rhode Island	1887	May 4
South Carolina	1898	First Friday in December
South Dakota	1890	Last Friday in April. By Proclamation*
Tennessee	1875	First Friday in March
Texas	1890	Third Friday in January
Utah	Between March 1 and April 15. By Proclamation*
Vermont	1885	Late April or May. By Proclamation*
Virginia	1892	Second Friday in March
Washington	1894	April or early May. By Proclamation*
West Virginia	1883	Early April (New bill will propose second Friday in April)
Wisconsin	1892	By Proclamation*
Wyoming	By Proclamation*

*By Governor; **By Commissioners; ***By Commissioner of Education.

Service backing, Florida, too, has long conducted highly successful tree planting ceremonies. Interest was even greater this year, probably due in part to the strong stand taken by newly-elected Governor Fuller Warren. The governor made "Pine Tree Prosperity" a major plank in his election platform.

Arbor Day is one holiday which for geographical, sentimental, or political reasons is celebrated in the various states on dates ranging from early December to early May. Nebraska, which observes April 22, birth date of J. Sterling Morton, further designates it a legal holiday. So do Wyoming and Utah. California gives it added impetus by making it fall on March 7, natal day of Luther Burbank, renowned naturalist. Pennsylvania chose April 9 to honor the birth of Dr. J. T. Rothrock, father of forestry in that state. Rhode Island's May 4 date falls on that state's Independence Day.

Dates in some states are set by proclamation of the governor or by departments of education. Climatic variations have caused a few states to select two dates. Such is the case in upper and lower Michigan, and in Maine and Arizona. In Oregon, residents east of the Cascades observe the second Friday in April, residents west of the Cascades prefer the second Friday in February.

Oregon, however, has drifted away from a formal Arbor Day observance, State Forester N. S. Rogers tells us, in favor of a new thought of kindred spirit and significance. The tendency now is to organize young folks, including Boy Scouts, 4-H Forestry Clubs, junior and senior high schools to plant a burned-over or denuded forest area each spring. Watersheds and state parks are popular sites, and on the designated "Planting Day" the entire student body is turned out for an all-day practical education in forest conservation.

"This program has been fostered by private foresters, schools, chambers of commerce and the Keep Oregon Green association, and is considered very satisfactory," Rogers states. The State of Washington leans toward planting and care of school forests.

Down Georgia way the State Department of Forestry purposely is not encouraging Arbor Day this year. The reason, says Ed Stout, information and education chief, "is that we are unable to meet the demand for trees for planting in spite of record-breaking production." The Georgia Department of Education, however, requests its observance right along

with other holidays listed on its school schedule.

Focal point of Minnesota's Arbor Day will precede the gubernatorially proclaimed date of May 6 this year. Several hundred schools will observe the official date, but the citizens around Red Wing have jumped the gun by designating April 28 as "Hay Creek Valley Arbor Day." They plan to turn from their daily tasks and assemble by the hundreds to plant some 62,000 trees on farms of Hay Creek Valley as part of a watershed plan of community soil and water conservation.

Retail businesses will close in Red Wing for the occasion. Thirty crew foremen have been selected to organize and direct community volunteers in this all out tree planting effort. The entire senior class and the general science class of the Red Wing High School will help. So will forty well-trained boys from the Red Wing State Training School; the Chicago Great Western Railroad section crew will contribute its services; and the Chicago Northwestern Railroad will demonstrate its mechanical tree planter on several of the larger areas. Every livewire organization in the county will cooperate.

There are other, if not so spectacular, examples of community participation. The Ak-Sar-Ben organization of Omaha last year offered a five-foot tree to each 4-H Achievement Club which reorganized before March 15. More than 700 clubs took advantage of the opportunity and planted their gift trees on Arbor Day. In the same city, F. J. Pipal, city forester, has performed outstanding work along similar lines for years. In Newark, New Jersey, the Shade Tree Department uses Arbor Day as the best time to help beautify its streets and parks.

The postwar period brought a reawakening of Arbor Day interest in a number of states. West Virginia was aroused from its tree planting lethargy only last year by the West Virginia Forest Council. Some 300 schools were prompted to enter into formal programs and planting projects, and more are expected to join them this month.

Womenfolk in Texas are leading the way. The Dallas Garden Club was instrumental in getting a bill through the state legislature designating the third Friday in January as Arbor Day. It used to be observed in February, but was dropped from the statutes when they were rewritten

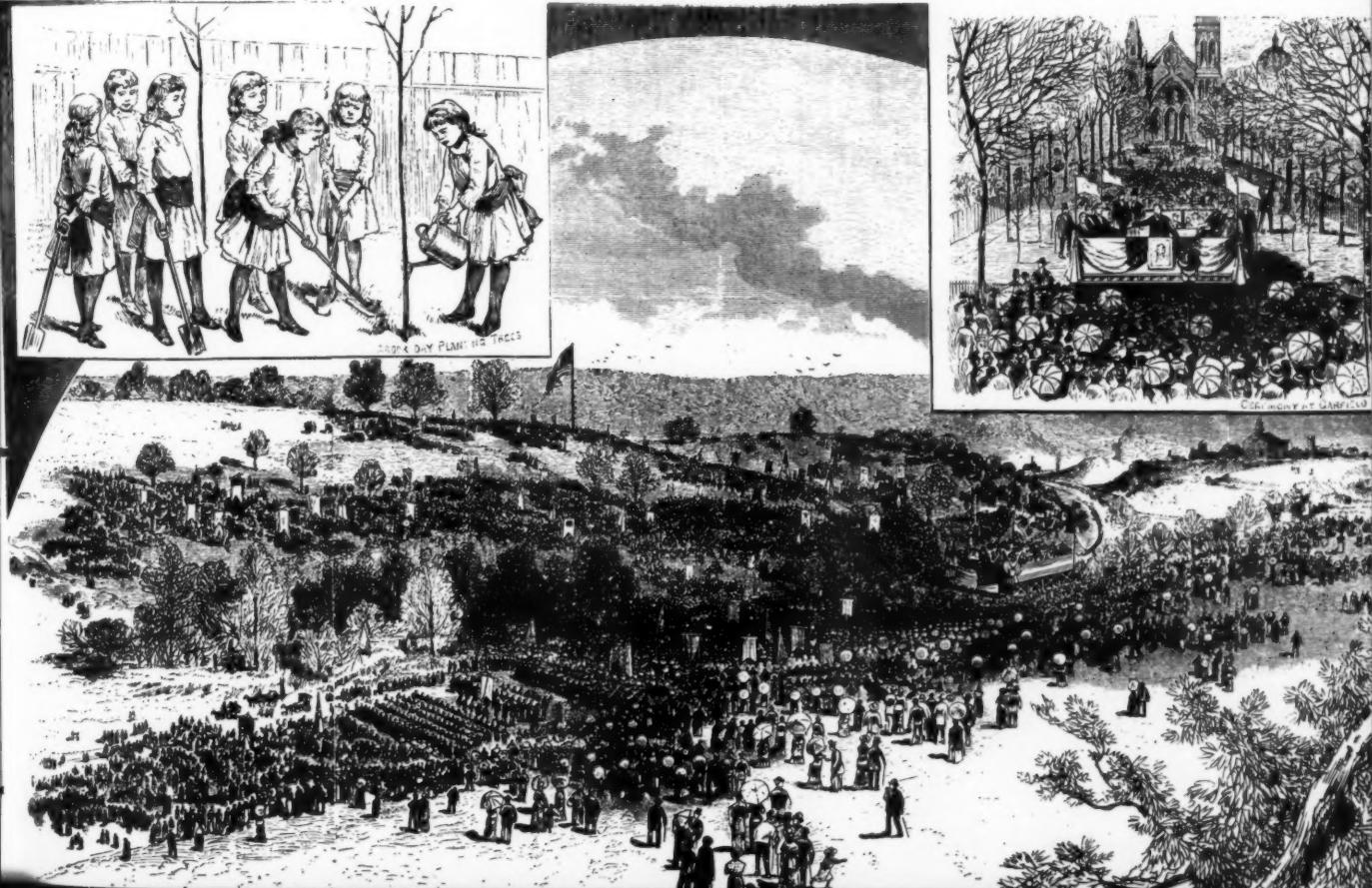
several years ago. The Texas Federation of Women's Clubs is also actively promoting the planting of pecan seedlings grown from trees at the grave of the late Governor James Stephen Hogg. Now the Texas Forestry Association is planning to publish an Arbor Day booklet as its contribution.

The garden clubs are also behind a movement in Maine to have the last Friday in April designated as Arbor Day. Nevada changed its date this year to the same time.

Industry has begun to lend a hand to stimulate Arbor Day. A number of the railroads have discovered the public relations value of such a movement, and so have many of the pulp and paper and large timber companies.

Probably the outstanding industrial contribution in the past six years, however, has been made by the Crown Cork and Seal Company of Baltimore, Maryland. Under the sponsorship of the late Charles E. McManus, then company president, an elaborate program built around the planting of an Arbor Day cork oak tree on the capitol grounds at Columbia, South Carolina, was held on December 3, 1943. The governor, Olin

A dramatic tree planting ceremony staged at Cincinnati, Ohio, in 1882 in conjunction with the first Forest Congress gave Arbor Day early impetus. Frank Leslie's Illustrated Newspaper published this sketch of the event



D. Johnston (now a senator), was the principal speaker and officiated at the formal planting.

Between then and 1948 plantings of cork trees on state capitol grounds have been held in nine other southern states and in California. In each case the governor headed a list of dignitaries which always included the state forester and the state superintendent of education. Representatives of women's clubs and other leading organizations have occupied prominent places.

These programs attracted thousands of adults and school children and gave them a new awareness of Arbor Day. It also helped the Crown Cork and Seal Company in its task of finding out what sections of the country could grow the cork oak, native originally to the Mediterranean area. Besides South Carolina and California, other states which have held programs to date include Alabama, Mississippi, Georgia, Florida, Louisiana, Arkansas, Maryland, North Carolina and Tennessee.

Two of these states augmented their state capitol plantings with county programs on the same day. South Carolina staged cork tree plantings in each of its forty-six counties. Georgia's 176 FFA chapters followed suit in 1947 by holding simultaneous programs in 105 counties.

Confronted by this wealth of testimony, it is safe to conclude that Arbor Day is firmly entrenched in the American tradition. It is worth the fight which J. Sterling Morton waged for eighteen years to get it recognized. Perhaps his task would not have been so great had he chosen any locale other than treeless Nebraska, but his successful perseverance against such a handicap is the more commendable.

Morton was a young man when in 1854 he broke virgin sod on his barren quarter-section Nebraska homestead. The land was rich but unlike the timbered Appalachians or wooded valleys of Ohio. He planted trees and encouraged his neighbors to do the same, but many lacked his foresight. As his trees and shrubs prospered he gathered more converts.

Word of mouth being too slow, Morton began to spread his tree-growing gospel through the medium of the *Nebraska City News* for which

he was writing. "Our seedling forests will nurse great timbers from which will come sills and joists to build the homes of thousands of new Nebrascans," he wrote. Prevailing against skeptics, he was ready on January 4, 1872, to go before the State Board of Agriculture and get that body to proclaim the world's first Arbor Day. A \$100 prize was offered to the county agricultural society and a \$25 farm library to the individual "that on April 10 shall plant properly the largest number of trees."

Tree planting festivals had a pre-

gan to celebrate the day in 1875. Minnesota observed its first official Arbor Day in 1876, but five years earlier the legislature had passed a "Tree Bounty Law" providing for certain payments for trees planted. Arbor clubs had selected Arbor Days in October of 1872, and in 1873 Congress had passed a "Tree Planting Act" which gave a patent to the homesteader for the entire "forty" when he had planted and cared for a certain number of trees on that land.

Perhaps the most memorable obser-

vation during this early period occurred in 1882 when Ohio's first Arbor Day was proclaimed to coincide with the first American Forest Congress, held at Cincinnati. This historic conference, planned by the first president of The American Forestry Association, Dr. John A. Warder, and by Judge Warren Higley, Baron von Steuben of the Prussian Forest Service and others, was so remarkably staged that it attracted 25,000 men, women and children.

Public response to this dramatic celebration was recorded thus in *Frank Leslie's Illustrated Newspaper*: "Twenty-five thousand persons gathered in Eden Park to witness the ceremonies attending the planting of trees in memory of many famous men. The public schools were closed and thousands of children were among the spectators. A procession marched from the city to the park and as it entered the ground, a salute of thirteen guns was fired."

Less than two decades after the first celebration in Nebraska nearly every state in the nation was observing Arbor Day. Canada followed suit in 1895 after the province of Ontario had set aside the first Friday in May as a tree and flower planting day. Hawaii and Puerto Rico first observed Arbor Day in the early 1900's.

Young Morton really started something. His influence first made Nebraska widely known as the "Tree Planter's State."

We today could add no greater tribute—and at the same time perform no greater self-service—than to make America known as the Tree Planter's Nation. By doing so we will, in effect, acquire a self-replenishing, non-cancelable stampbook of tree wealth for the future.

A SUGGESTED ARBOR DAY PROGRAM

SONG . . . America

PRAYER OR INVOCATION

READ GOVERNOR'S PROCLAMATION (Or law pertaining to Arbor Day)

ROLL CALL

(Pupil responds with an appropriate fact or quotation about a tree)

THE FIRST ARBOR DAY . . . By a pupil

MUSIC . . .

(Selected numbers should be well placed throughout program)

SHORT ADDRESS BY VISITING SPEAKER (Or read message from State Educational Director or State Conservation Commissioner)

PAGEANT OR RECITATION

THE STORY OF OUR TREE

(Teachers should tell name of tree to be planted, why it was selected, how fast it may be expected to grow, whether it will have blossoms, fruit, the shape of the leaf and other such interesting information)

TREE PLANTING CEREMONY

CLOSING PRAYER OR SONG

cedent, but an Arbor Day in Nebraska was new. George Washington had planted countless varieties of trees around his Mount Vernon estate. There was a fifth-century record of the Swiss planting again and again before they established a forest at Brugg.

Plenty of hard work helped bring public enthusiasm to a high pitch by the time the first Arbor Day came around. Farmers and townspeople responded on April 10 by planting nearly a million trees! Two years later the governor set aside the second Wednesday in April as Arbor Day, a date observed until 1885 when the state legislature changed it to Morton's birthday, April 22.

Nebraska's boundaries proved too small to hold this new tree planting concept. Tennessee and Kansas be-



This Badger Tree Planter is made in Wisconsin

Manufactured on a commercial basis only within the past few years, the tree planting machine is hastening reforestation on many fronts. Pulled by a tractor, this mechanical device and two men under the most favorable conditions of soil and topography, can plant up to 14,000 seedlings in an eight-hour day, or five times as many as two men can plant by hand. And, on the basis of current labor costs, it sets out nearly twice as many trees an acre for the planting dollar.

About 2,000 of these machines are now in use. They are planting trees on soil conservation projects, on farms and on national and state forests. Lumbering and pulp and paper companies are using them to restock denuded lands. Railroads are buying them for demonstration purposes on farms.

One of the most interesting developments in the use of the tree planting machine in the protection of watersheds has been recorded by the Muskingum Watershed Conservancy District in eastern Ohio. To curb siltation into streams and reservoirs, Muskingum officials launched upon a large-scale tree planting program, experimenting with a machine developed by two engineering professors at Michigan State College, L. E. Bell and T. D. Stevens. This machine, called the "Michigan Reforester" worked well enough on smooth, clear

areas, but it bogged down on rough hillsides. As a result, H. P. Garrett, forester for the conservancy district, developed plans for a hillside planter, and these were later perfected by the agricultural engineering department of Ohio State University and the Lowther Company of Joliet, Illinois.

The tree planter is an odd-looking machine that hugs the ground. It moves on three wheels, and the man who does the planting sits in the rear close to the ground. On the front of the machine is a coulter, a wheel-shaped blade, which cuts the

sod as the equipment is pulled along by the tractor. A plowshare makes a furrow, following which a second coulter knifes roots and protects the trencher device, which then digs a trench four inches wide and eight inches deep. The workman, sitting in the rear, places the seedling in the trench, holding it upright long enough for two rubber packer wheels, set at an angle almost V-like, to tamp the soil around each young tree.

When operating on hillsides, the machine developed by Garrett is

(Turn to page 40)



The Lowther is widely used in the East

In Indo-China, Malaya and Indonesia, foresters are struggling to bring order out of chaos

Forests in Ferment

By M. A. HUBERMAN

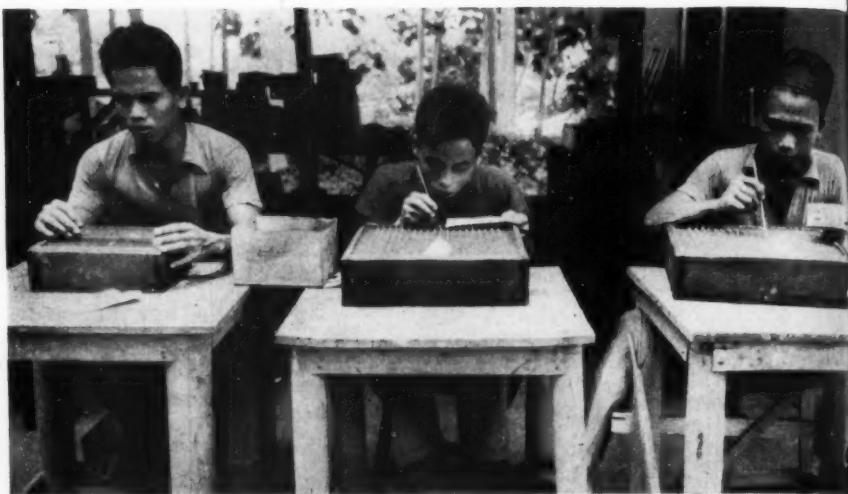
Part III

Flying from Hongkong to Saigon we passed over part of French Indo-China's forested hills, an irregular patchwork of dark and light green. Puzzled at first, I soon recalled having seen similar patterns in South America. It was the shifting cultivation or nomadic agriculture practiced in almost all tropical and subtropical regions—an old, old story.

The system goes back a long way—in Africa, in Latin America and throughout southeast Asia. It might even be said to have had its counterpart in extensive cultivation by some of the American Indian tribes. From ancient times, the fertile valleys were the first to be occupied and cultivated, more or less permanently. The crop yields were probably sufficient to cause the cultivator to settle down on a particular piece of land and to eventually acquire ownership.

This was not true of the forested hills. For one thing, they were less fertile than the valleys and crop yields were not always high. Then clearing land of trees, brush and briars was harder work than preparing the valley soils for cultivation. Furthermore, these hill dwellers relied upon wild game, rather than domesticated animals, to supply meat for their table. And if it was not plentiful at hand and had to be pursued far afield, farming probably became of secondary importance.

These roving people had no strong ties to a specific piece of land and therefore were not anxious to put up



Skilled Indonesian research workers conduct thorough laboratory tests of tree seed germination at the Buitenzorg Forest Experiment Station in Java

long-lasting houses, to develop water supplies, or to perform any other task that would build for the future. Living was something for today.

So they girdled the big trees on a small patch of land and cut and burned the undergrowth. No one ever bothered to put out the fires and, unless checked by heavy rains, they would often spread over entire mountainsides.

Crops were planted and harvested the first year. After that, because of competition from sprouting brush, returns from their effort diminished. Depending on rainfall, temperature and the type of native vegetation,

these clearings would have to be abandoned in from two to five years. Then the process started all over again on another small patch of land.

Where the hills were sparsely populated, the clearings could lie fallow from perhaps five to fifteen years before they were burned and cultivated again. In some regions the soil would be replenished between successive operations, but too often there was a continuous deterioration of the soil and of the vegetation. In these areas trees were replaced by brushy shrubs and briars, later by grass. If further fires eliminated this, heavy rains eroded the soil.

Then the hill dwellers moved on to eke out a poverty-generating existence elsewhere. Meanwhile, the valley farmers in the densely populated areas suffered the consequences through floods, silt flow in the streams and lack of water for irrigation.

So these light, medium and dark green patches in the hills were more than eye-pleasing color schemes. As foresters told me in French Indo-China, unless vigorous measures of control are applied quickly this pattern of land misuse may render much of the region uninhabitable.

But in that country, too, political and economic conditions are so unsettled that it is difficult and certainly inadvisable to seek to enforce legislation which may work even temporary hardships on the people. This is especially true in the case of the



Chinchona bark yields quinine in Java

hill people who during the war made up an important part of the guerrilla opposition to Japanese occupation. They will not lightly give up their war-acquired spirit of self-reliance and militant independence.

As a matter of fact, the greatest measure of success against shifting cultivation has been achieved by those governments who have relied not on rigid arbitrary enforcement of laws disregarding the present as well as the long-term needs of the people, but on a combination of measures, including adaptations of customs and resettlement of the hill people.

The French foresters showed me maps of their forest reserves, pointed out the mountain tracts they hope to designate for watershed purposes, as protection forests. As in Malaya, any clearing of such reserved areas would not be permitted except by

authority of a sort of land classification board consisting of foresters, agronomists, soil specialists and water engineers. Then they took me to Cambodia to see demonstrations of their *culture intercalaire*, which they hope to apply on a large scale when things settle down.

Here they have set up temporary villages in clearings in the forest.

The villagers and their families cut the low-value indigenous forest, haul the best logs to a sawmill for house-construction lumber, and deliver the rest of the wood to kilns where it is burned into charcoal. The debris is burned under controlled conditions.

The areas thus cleared are assigned by lot to the villagers who then plant teak seeds or cuttings in rows about six feet apart, and sow their crops between the rows. As they weed and

cultivate their food crops they hoe around the young teak trees. Cultivation continues until the trees shade the crops. Then the villagers move on to another area. This process is repeated until that portion of the forest reserve within reach of the village location is completely converted to teak or other valuable species. The village is then moved to another area in need of such conversion.

This is practically the same as the taungya system of Burma, or a similar system in Java. It seems to be working satisfactorily where the people are willing to settle down instead of roaming freely over the hills; where they are willing to live and work together under some degree of government supervision.

Constructive forest work can be done only under settled conditions where the local population is in full agreement with the government authorities. Unfortunately, such conditions do not exist in most of French Indo-China, Malaya, or Indonesia. Not only do these unsettled conditions prevent progress in useful demonstrations, but everyday activities in forest conservation and timber utilization are slowed down.

Most of the provincial conservators have been moved into Saigon. Their work of forest management has been suspended. Logging operations are almost at a standstill because forest labor is difficult to get. This, of course, results in shortages of logs at the sawmills in and around Saigon and Cholon.

One Sunday I drove to a large modern sawmill a short distance out of Saigon. We had to start early so we would be back in Saigon before dark. Loaded riot guns were held across the laps of my guides during the entire trip. As we walked through the mill grounds inside a high concrete wall and barbed wire fence, I noticed that the comfortably appointed swimming pool attached to the palatial residence of the sawmill manager was being used by a group of French Legionnaires—the protective garrison of the mill property. I also noted an army tank, its treads removed, bolted to a flatcar, with its turret gun pointing out over the wall. The flatcar was on tracks which ran completely around the mill property just inside the wall.

Our host, the mill manager, ruefully explained that unusual as such



APRIL, 1949

Proof of the ferment in the Orient as recently as mid-1948 are these battle-weary Dutch Marines in Java

"sawmill" equipment might seem to me, the garrison had had occasion to make important use of it.

As if to emphasize this ferment in the forest, we saw in a small town not far from Saigon a military funeral of two officers and five enlisted men of the Legion who had been shot in skirmishes two nights before.

The forest experiment station on the outskirts of Saigon had recently been burned down, destroying equipment, valuable collections of wood specimens, library books and documents. But here again the foresters were far from discouraged by such setbacks. They still had their plans for more forest reserves, for construction of access roads into heavily forested regions, for silvicultural work, for the expansion of their *culture intercalaire*, and for a government logging and sawmill project.

They hope to train forest rangers and to select each year three or four outstanding men among them to send to France for professional training. In the meantime, they are promoting the most likely of the present Indo-Chinese staff men to more responsible posts and designating French foresters as counselors. While the system is too new to judge its effectiveness, the French feel that the rate of progress in all efforts will be much greater when the ferment stops.

At the time I was in Malaya the headlines were not so big and black as they subsequently became. Except for a few mysterious accidental fires in rubber factories or tin mine managers' homes, things were what residents of Singapore and Kuala Lumpur regarded as normally tranquil. As a result, the British foresters were busily occupied with administering sales of timber from the reserves and of revising management plans.

In Singapore the forest officer showed me each of the sawmills in that interesting city. They were just reopening after a protracted strike over wages, an important part of which is paid in rice. Using logs from Malaya, and from Borneo, Java, Sumatra and other parts of Asia, these Singapore mills cut lumber and dimension stock for export, in addition to domestic lumber items. The export material is inspected by the staff of the forest officer to make sure size and grade specifications are met by each producer.

This is a sensible idea for any country desiring to build up or maintain a good reputation as dependable suppliers.

Based on the experience of the saw-

mill men with their customers, and the research work being done at the Kepang Forest Experiment Station, the Singapore forest officer was attempting to develop grading rules for all export lumber items, to satisfy American, British and European importers, as well as his own producers.

The Kepang station has also done a highly important job in persuading the Malayan State Railways to use creosote treated ties, or sleepers as the British call them. This station has also made a valuable contribution in identifying the important timbers of Malaya, determining their strength properties on modern testing machines, and publishing the re-

LESSON IN CLIMATE

Climate is affected by vegetation. A case in point is Tennessee's Copper Basin where the effects of land denudation on local climate is startlingly apparent. Summer mean maximum air temperatures are 2.1 to 3.5 degrees higher in the bare zones than in the adjacent forest—wind velocities from five to fifteen times higher.

sults so lumber producers and buyers will know what they are getting.

It was remarkable that the beautiful building of the Kepang Forest Research Institute was not destroyed during the Japanese occupation. I asked about the same thing at the Singapore Botanical Gardens, and was told that the Japanese commanding officer happened to be interested in botanical research. True or not, the fact that the collections, records and herbarium material were left intact has saved many years of work.

Also at Kepang was located the forest ranger school where local staff men are taught forestry in the vernacular, not in English. They come there with their wives and children, live in pleasant little cottages, and learn such things as map making, tree measurement, wood identification and elementary surveying.

When they have finished the class and field work, as over 150 have since 1928, they are eligible to hold positions in the subordinate service. They thus serve under the British gazetted forest officers who are all graduates of Oxford, Cambridge, Edinburgh, or European schools.

On Java we drove over paved roads, past schools and hospitals. On the steep slopes of mountains at high elevations, we saw well-terraced, irri-

gated rice paddies. The terracing was so intensive that some individual paddies were no bigger than a dining room table.

What interested me especially on this beautiful island was that the tops of the mountains had been left in natural forest, or had been planted to forest species to protect the watersheds and assure a constant supply of water for the rice cultivation. With one of the heaviest populations per square mile, the Indonesians had been forced early to the adoption of such vital conservation measures.

It was this rural rice-growing, tree-growing part of Java that showed what this marvelous island could be. Here land was used for the maximum benefit of the people on the land. It was different from cities like Batavia and Soerabaya which still have the slowly healing scars of war. It was different from the small villages in the vicinity of Buitenzorg, Bandoeng, and Semarang, where houses were freshly destroyed and farms abandoned, with Dutch soldiers disconsolately patrolling the ruins.

At Buitenzorg were the most interesting botanical gardens I have seen. It was a botanical education just to see them, especially under the supervision of Dr. Baas-Becking, scientist, humanist and self-styled "imperial colonialist."

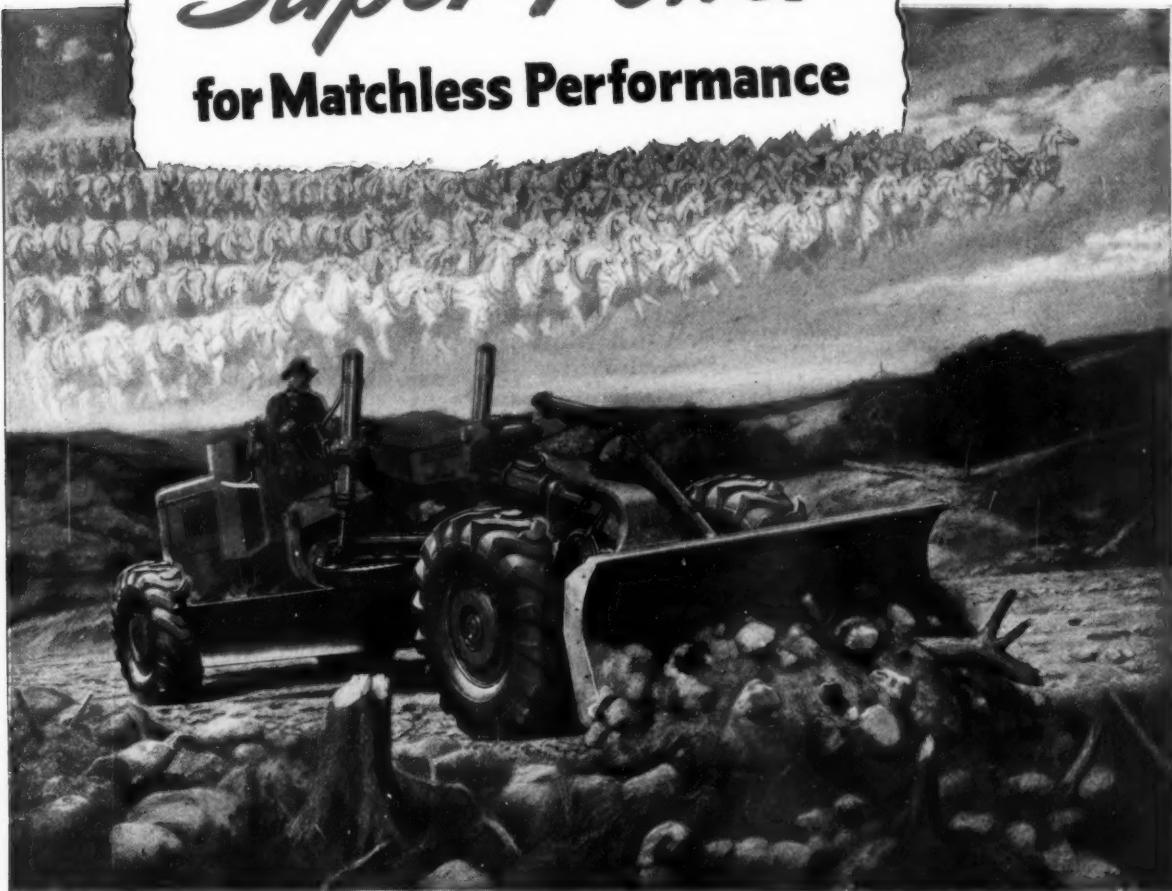
Dr. Baas-Becking smiled when he told me, as we rode in his jeep, of his "imperialistic colonialism"; but the admiring and smiling welcome he received from the laborers in the gardens showed just what kind of an "imperial colonialist" he was. He had done important underground work during the war, for which he was highly decorated.

Although Buitenzorg was occupied by the Japanese, and although there has been considerable disturbance since in that area, Dr. Baas-Becking's works in the gardens, laboratories and schools have remained unmolested. Above all, he has keen appreciation of what proper land use can mean in terms of peoples' livelihoods and welfare.

When the ferment stops in Indonesia's forests, the Dutch and Indonesian foresters, soil conservationists and agricultural engineers will do well to follow Dr. Baas-Becking's precepts.

(Mr. Huberman will conclude his series in the May issue with observations on conditions in the Philippines and Australia.)

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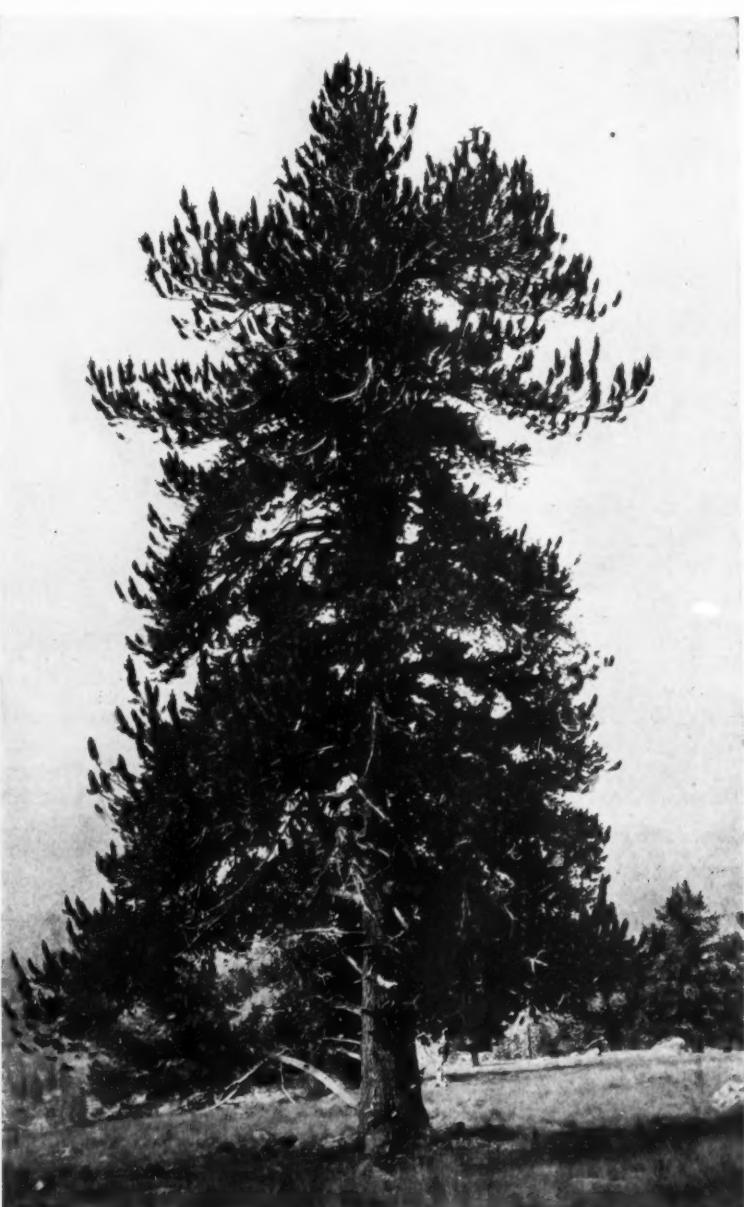
—BRISTLECONE PINE

Pinus aristata, Engelmann

By WARREN D. BRUSH

BRISTLECONE pine gets its name from the long, slender, bristle-like prickle which is borne at the end of each cone scale. Another name applied to it is foxtail pine, because the arrangement of the needles in brush-like tufts at the ends of the twig resembles a fox tail.

This is a tree of the high mountain regions, from 8,000 to 11,000 feet elevation. It maintains its existence under adverse circumstances where it is cold and stormy in winter and where the brief growing season is subject to excessive drought. At the upper limit of its growth, it clings to stony ledges and wind-swept ridges, where the ungainly trunks are welcome to the traveler, miner, or sheepherder who is in need of shelter or of fire for his camp.



Arnold Arboretum

In favorable locations at high elevations, Bristlecone Pine is a bushy-crowned tree from thirty-five to forty feet tall. Elsewhere it is a twisted shrub

It grows from the outer range of the Rocky Mountains in Colorado to southern Utah, central and southern Nevada, southeastern California, and the San Francisco peaks in northern Arizona. Rarely forming pure stands, it is usually scattered on thin rocky soil, mainly on south slopes, with little or no underbrush. It is most abundant at higher levels where its only associate is limber pine, which it somewhat resembles in manner of growth. The two can be readily distinguished, however, by the shorter needles of the bristlecone pine.

It varies in height and form from a half-prostrate, twisted shrub at very high elevations, to a bushy-crowned tree from thirty-five to forty feet in locations more favorable for its growth. Ordinarily, from fifteen to thirty or, at the most, forty feet high, with a short stocky trunk twelve to eighteen, or sometimes thirty, inches in diameter, which is commonly clothed for the greater part of its length in a dense, wide, irregular crown. In older trees, the upper branches are erect and much longer than the usually pendulous lower branches. The rather wide bushy crown of long, drooping lower branches and of irregularly long, upright top limbs is characteristic of single trees or those in open stands on wind-swept slopes. In denser stands, in less exposed situations, the crown form may be narrower. Young trees have a distinctly pyramidal crown with short, rather thick branches which stand out from the stem at right angles.

The stout, light orange-colored twigs turn to dark gray-brown, or nearly black, with age, and are clothed at the ends with long, compact, brush-like tufts of foliage.

Because of the small size, poor form and inaccessibility of trees, bristlecone pine contributes little or nothing to the nation's timber supply. This species provides, nevertheless, valuable cover on many of our high western watersheds. Growth is very slow and the trees attain an age of 300 to 375 years. Trees from sixteen to twenty inches in diameter are from 200 to 250 years old.

The stout, curved, deep green needles, five to a bundle, are densely clustered at ends of the twigs. Each mature needle is one and one-fourth to one and one-third inches long, lustrous on the back, and often showing on the surface minute but conspicuous whitish resin flecks. The leaves of each season's growth persist for fourteen to seventeen years.

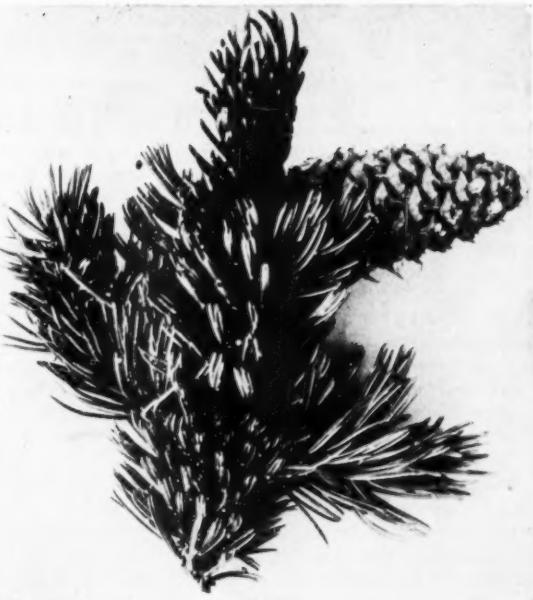
Dark orange-red pollen bearing flowers are borne on spikes throughout the crown; while the dark purple female ones are borne at the ends of the twigs. The cylindrical, nearly stemless cones mature at the end of the second season and are then two and one-half to three and one-half inches long, deep chocolate-brown, tinged with purple. They hang at the very tips of the branchlets, opening and scattering their seeds about the first of October. Each cone scale is armed with a sharp, slender, and very fragile incurved prickle nearly one-fourth inch long, which is often covered with brown, shiny droplets of resin.

The seeds are nearly oval, light brown, often mottled with black, with long, thin terminal wings. The trees begin to bear cones when they are about twenty years old and seeds are produced every season with especially heavy crops at intervals of several years. The large winged seeds are taken a considerable distance by the wind, often as much as 600 feet from the parent tree. Nevertheless, reproduction is usually sparse and scattered as many of the seeds are eaten by rodents and others never find conditions suitable for germination.

The bark is thin, smooth and grayish white on the stems and branches of young trees. On the trunks of old trees, it is a dull reddish brown, one-half to three-quarters of an inch thick, rather shallowly furrowed, the main flat ridges irregularly connected by narrower slanting divisions, the surface covered with small scales.

The narrow-ringed wood is light, soft, weak, pale brownish red with a thin layer of whitish sapwood, and weighs thirty-five pounds to the cubic foot in an air-dry condition. Because of the small size of the tree and its poor timber form, the wood is little used, except in localities where better timber is scarce. There it is in demand for mine props, railway ties, fence posts and fuel. Although it is low in resistance to decay, fence posts and ties may have a fairly long life when used in dry regions.

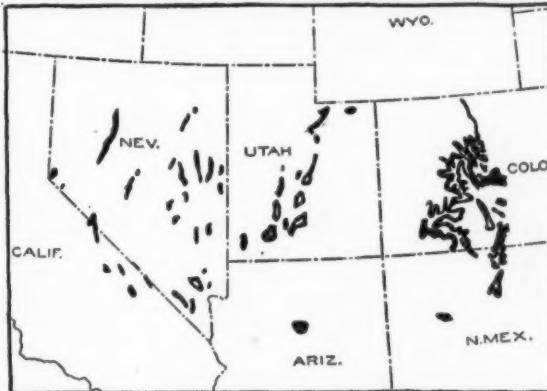
Bristlecone pine can be grown on the plains as an ornamental evergreen. In cultivation, it is usually a handsome low shrub, with ascending branches densely clothed with appressed leaves sprinkled with white grains of resin, a characteristic by which the species is easily distinguished from other shrubby pines.



Stout, curved, deep green needles are densely clustered at the ends of the twigs. Each cone scale bears a sharp, curved point



Young bark is thin, smooth and grayish white. On old trunks it is dull reddish brown, thick, scaly and shallowly furrowed



The natural range of Bristlecone Pine

Village for Lonely Loggers

(From page 11)

ters, Swedish forest industry is in no exuberant mood.

Putting up a forest workers' village does not stop, as a rule, with a line of frame buildings. A common bathhouse, located in one of the buildings and serving all families on scheduled occasions, may be necessary. The community laundry is another innovation. I saw one of these in Värmland. A group of electric-driven washing machines, with huge drying ovens, delivered the family wash to the electric ironers with a minimum of manual labor. The village women, in the midst of these muscle-saving devices, have a wonderful go at gossip and banter and they looked thoroughly pleased to load their drudgery on mechanical slaves. I asked some of them if they still wanted to migrate to the big towns. They didn't—not for a while.

One of the most extraordinary illustrations of the course that rural housing may take, as the controlling factor in forest management, is furnished by the University of Uppsala. Fifteen years before Columbus discovered America, the first classes assembled at Uppsala for the study of philosophy, and since that time 472 graduating classes have passed from the college halls. With all those centuries in which to make up its mind, Uppsala for the past fifty years has been investing every spare dollar of its revenues — gifts, endowments, scholarship funds—in forests.

In its possession today are 92,000

acres of timberland, upon which the institution places a value of \$7,000,000. The net return—almost exactly fifty percent of the gross—is slightly over three percent a year. Possibly no other university in the world has turned to timber business as a deliberate hedge against the hazards of common forms of investment. There are "college forests" in America, of course, but used mainly for instruction of students in a forestry faculty.

Uppsala's plan of forest management follows a strongly conservative pattern. No artificial regeneration is undertaken, despite the fact that Swedish foresters more and more employ seeding or planting and undoubtedly will extend it greatly in the future. In keeping with forest management regulations applying to all parts of the nation, Uppsala's woods are handled by graduate forest engineers and a staff of trained assistants.

Their conservation constantly reverts to one theme—that the university must improve its capital stock as a multiplying heritage for future generations. Of course, the foresters make as many good sales as possible, for the institution surely needs the proceeds, but it is the engineer, and he alone, who decides what shall be cut, and when—never the buyer. No doubt, this has a tinge of altruism for the American logger who hardly may be expected to contemplate a piece of timber country with the same abstraction as the Rector Magnificus of Uppsala.

How a university can get so deep in the woods is explained by an event in Uppsala's early history. The town, center of the dominant ecclesiastical see of Sweden, held a national prominence dwarfing the then minor municipalities of Stockholm and Gothenburg. To establish a university on a major scale, King Gustaf Adolf, in 1624, donated from his immense estates 32,000 acres of woods, scattered across several of the provinces. For ages, Sweden remained a purely agricultural economy in which forests had a limited employment. But when world demand commenced to bid for Swedish timber, iron, and steel, industry toppled agriculture and became the seventy-percent factor in the country's annual income. In this evolution, Uppsala's university forests achieved fresh values and in the eighteenth century the entire institution was supported on revenues from timber sales, plus the profits of a chain of 411 college-owned farms. Today, the farms show no net profit, and it is the timberlands that help to carry the educational load. Why the collapse of farm values? The answer ties in to Uppsala's forest management system.

By gift and purchase, Uppsala became the owner of 33,000 acres of good farm soil, divided among 411 tenant occupants. For long decades, the proceeds gave a welcome lift to the university's treasury, and the available manpower was utilized in woods operations. A large portion of the rentals was paid in farm produce and the professorial staff had their cellars well stocked, even if

(Turn to page 34)

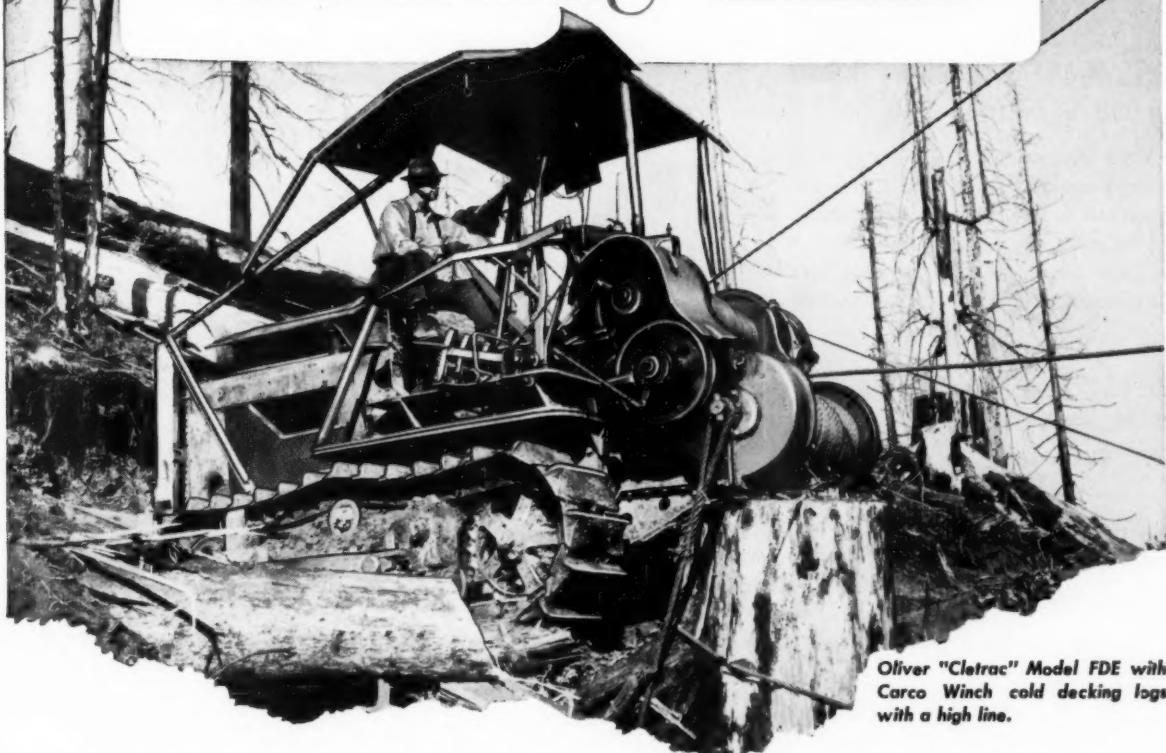


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Dining room for single men at a Swedish State Forest

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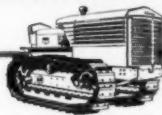
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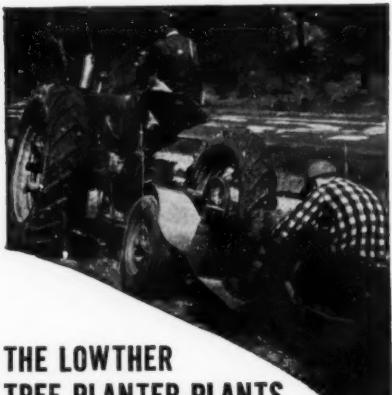
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OUT ON A LIMB

By BRADFORD ANGIER

"He who plants a tree," said Lucy Larcom, "plants a joy." Trees beautify, protect, and enrich our land. They're with us from the cradle to the coffin, but how much do you know about them?

Twelve or more correct answers is excellent; 9-11, good; 6-8, passing. Less than six puts you "out on a limb." Answers inverted below.

1. Who despaired of ever seeing "A poem lovely as a tree"?
a. Mark Twain b. Joyce Kilmer c. Louisa M. Alcott
2. Indians still find this tree invaluable for canoes.
a. Pine b. Beech c. Birch
3. How many species of trees are native to the United States and Canada?
a. About 100 b. Nearly 250 c. Over 1,000
4. What is the most valuable tree in the world?
a. Maple b. Rubber c. Date
5. What is a tree creeper?
a. A small bird b. A tropical insect c. A vine
6. The General Sherman Bigtree, in Sequoia National Park, is said to be the largest living thing in the world. If all its wood could be used, how many average houses would it build?
a. About 30 b. Nearly 100 c. Over 350
7. Do trees breathe?
a. No, a tree gets its nourishment from water and sunlight.
b. Yes, trees require oxygen as human beings do.
8. Because its Vitamin C content helps ward off scurvy, woodsmen have been making tea from this since pioneer days.
a. Sassafras leaves b. Choke cherries c. Spruce needles
9. Which of these woods makes by far the best fire?
a. Pine b. Cedar c. Hickory
10. May a poplar tree be planted in New York City?
a. Yes, if fenced from animals for the first year.
b. No, it is forbidden by law.
11. The charter of the Connecticut Colony is supposed to have been successfully hidden in what tree when King James II demanded its surrender?
a. Washington elm b. Charter oak c. Penn Treaty oak
12. The Founders Tree in California, a redwood said to be the tallest tree now known, is how high?
a. About 200 feet b. Over 360 feet c. Nearly 510 feet
13. What is a treenail?
a. Spike on telephone pole b. Wooden peg c. A hitching ring
14. The inner bark of which of these trees is still sometimes dried and ground into flour?
a. Birch b. Poplar c. Pine
15. What famous woodsman carved on a beech tree in Tennessee, "cilled A Bar On Tree in THE YEAr 1760"?
a. Kit Carson b. Sam Bowie c. Dan Boone

Answers: 1. b; 2. c; 3. c; 4. b; 5. a; 6. c; 7. b; 8. c; 9. c; 10. b; 11. b; 12. b; 13. b; 14. a; 15. c.

Genetics

(From page 17)

through hybridization new varieties combining the best qualities of two or more species.

It is common knowledge among animal husbandmen and horticulturists that crossing or hybridizing different breeds of the same kind of animal or plant will often produce a hybrid larger and stronger than either of its parents. The institute has produced twelve hybrids since 1940 and of these four showed vigorous growth at three years and one or two others look promising. The remainder show intermediate vigor.

The institute with its arboretum, containing most of the pine species in the world and its records on desirable parent trees, is in a unique position for successfully conducting hybridization experiments on pine trees. With so many species with which to work, the job of hybridization becomes tremendous. In one year more than 8,000 flowers were pollinated by hand by the institute staff.

One of the outstanding hybrids produced to date has been a cross between Monterey and knobcone pines. Monterey pine lacks hardiness but grows fast; knobcone pine is hardy but grows slowly. Monterey pine contributed its fast growth, and knobcone pine contributed hardiness to the qualities of the hybrid which was named *Pinus attenuata*. Such a fortunate combination of good qualities is not common, explaining in part why so many crosses must be made before a satisfactory hybrid is found.

A cross-pollination of Western white with Eastern white pine has produced a hybrid which at four and a half years old is twice as tall and three times as heavy as either parent tree at the same age. This indicates that this hybrid may be ready to saw into lumber at age of forty to fifty years as contrasted with eighty or 100 years for the parent trees.

Dr. John T. Buchholz, of the University of Illinois, is developing a method for determining what hybrids are successful by examination of the embryos even before the seeds mature. Growth potentiality of a new hybrid may be determined in fifteen months or less instead of three to five years, as in present nursery trials.

The assumption that most species of pines will not produce cones until they are ten or twenty years old has

(Turn to page 41)

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Lonely Loggers

(From page 30)

they saw few silver kronor. Nowadays, with eighty professors on the staff, everything is on a cash basis and, to make it so, the Swedish government chips in \$1,400,000 annually.

In recent years, in consequence of Sweden's peculiar regulations, the owner of one or a hundred farms, occupied by tenants, must maintain all farm buildings in a state of high efficiency—yes, and a state of high comfort and decoration. The tenant, also serving as a woods worker, merely sits pretty and calls on the owner for a new silo, roofing, water-pumping systems, or whatever else can go wrong on a modern farm. During

the last ten years, repair and maintenance costs in Sweden have become a landlord's nightmare, in consequence of which the outgo on Uppsala's 33,000 acres outstrips the income. And yet, by law, the tenant cannot be displaced nor his privileges curtailed. If a labor force is to be available to the university's forests, farm families must be retained in the neighborhood of the timberlands, whatever the cost. The latter phase, however, has its limitations. Forests are grown for profit, and the profit has its source in export markets. How far those markets will concede valet service for the hewers of wood is not, at the moment, decided.

Mount Rainier

(From page 15)

acceptance of the idea of preservation for posterity. But no, the newly born "bureaucracy" came in for an almost immediate accusation of locking up essential resources, and the issue was joined.

A brief review of the basic elements of the act to establish a National Park Service is necessary to understand future developments.

"The service thus established shall promote and regulate the use of the federal areas known as national parks . . . by such means and measures as conform to the fundamental purpose of the said parks. . . . which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

The intent of the act is clear, but the interpretation of these simple phrases has been, and will no doubt continue to be, a difficult and complex thing.

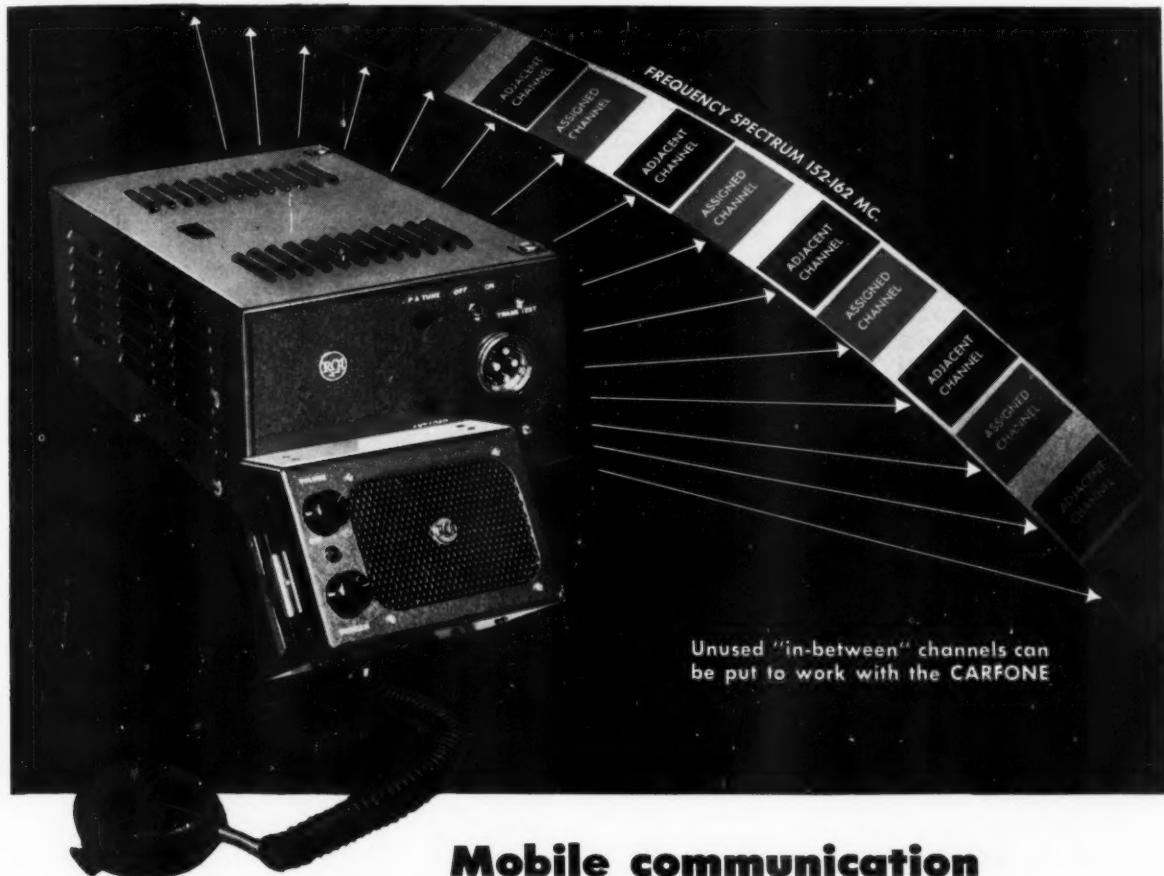
In short, the National Park Service is charged with the conservation of the "scenery and the natural and historic objects and the wildlife" in such fashion as to leave them unimpaired for future generations, and at the same time these features are to be used and enjoyed by the visitors to the national parks. And so the line must be drawn. Use and enjoy your national parks up to but *not beyond* the line which marks the barrier between use and the impairment of park values. A difficult line to draw? The National Park Service has found it so. Each of the parks has had a

varied and perplexing series of problems, ranging from the logical and feasible developments coincident with visitor use to those which enter the realm of the ridiculous.

Of these, Mount Rainier has had a full share. Not the oldest of our national parks, not the largest, but certainly one of those deserving of the superlatives employed in describing its great scenic beauty. The central feature of the park, the mountain itself, bears upon its volcanic bulk the largest single peak glacier system in America. This feature alone justifies its status as a national park. Add the splendor of magnificent virgin forest, unsurpassed flower gardens, an abundant wildlife, all of the things which go to make up a comparatively inviolate wilderness area, and the entity is one of nature's masterpieces.

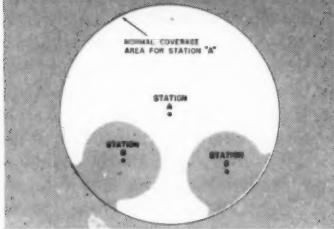
This area, embracing some 378 square miles, is to be used and enjoyed, and to provide for this use and enjoyment certain developments must be foreseen and provided. Highways, campgrounds, hotels, lodges, trails communications, to name a few. These must be designed and located in such a manner that the impact of hundreds of thousands of visitors each year, most of them in two summer months, will not impair park values. And it is being done, not perfectly perhaps, but to the satisfaction of the vast majority of those who avail themselves of the facilities each year.

Early in the history of the park the obvious need was first for the development of such facilities. The area was isolated, inaccessible, and provision for use was a primary con-

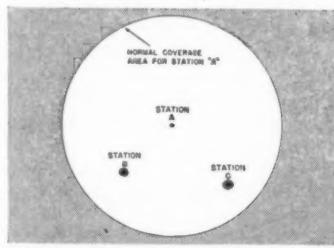


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sideration. By 1911 the first automobile was driven to the Paradise Valley. Driven is hardly the proper term. The vehicle was pushed, dragged, and driven over a dirt road which was deplorable, even for those times.

The public was not permitted to drive motor vehicles to the valley until 1915. Prior to that date horses and wagons served as transportation, but with greater ease of access visitation to the park began to increase rapidly. Rather than hundreds of visitors annually, soon there were thousands, additional developments were imperative, and were provided.

It became apparent that development was no longer of paramount importance — protection and conservation problems increased with use, the impact of the hundreds of thousands was making itself felt. The line of demarcation became increasingly difficult to draw. How were these hundreds of thousands to be accommodated, and yet protect park features? The perplexing proposals appear upon the scene. Existing developments become inadequate. The process of weighing begins. Is the proposal justified in its contribution to increased use of the park? Does the proposal destroy or damage the natural scene? How will it affect intrinsic park values? Consider a recurring proposal.

As far back as 1915, coincident with the opening of the motor road, the idea was advanced that a tramway or cog road be built extending from Paradise Valley to the summit of Mount Rainier. Through the years this idea has been revised and elaborated, until at present the plan visualizes an enclosed, electrically operated cog-rail system. A combination of tunnels and subways constructed beneath the glaciers would enter the earth at the site of Paradise Inn, and emerge in a modern hotel structure in the crater at the summit. Some good engineering minds have vouched for the feasibility of the project.

Proponents of the plan point out this would be a specific, unique and

singular feature, a distinctive tourist attraction, a great engineering feat, and visioning the possibilities for tourist travel after Mount Rainier had been so "improved," they hold that without a shadow of doubt the project would "pay off." Shall we grant then, that such a development would contribute to the visitor's enjoyment of the national park? Perhaps it would, for some. Yet we find an increasingly great number who appreciate beauty in nature as it was created, who feel that it need not be improved upon or modernized to provide a maximum of pleasure and inspiration.

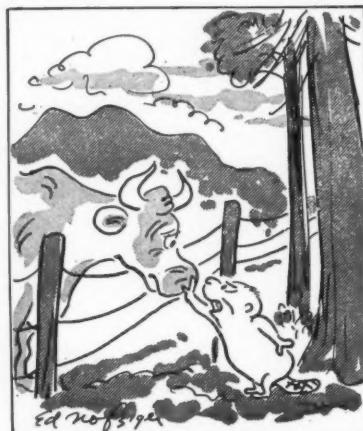
Last year newspapers from coast to coast gave widespread publicity to a scheme which advocated the construction of a monument on the mountain's crest, the purpose being to place Mount Rainier second in rank among the major peaks of the United States. This was no new proposal. The state of Washington celebrated its Golden Jubilee in 1939, and to commemorate that date one ardent Washingtonian advocated an even more ambitious spire.

"The monument should be set up on the highest pinnacle of Mount Rainier. At the twelve-foot level it would reach above Mount Massive and regain, for our mountain, its former position as third highest. At the twenty-five-foot level it would outreach Mount Elbert and place Rainier in second place. At the ninety-foot level, however, and there should be little difficulty raising a monument that high, it would overtop Mount Whitney and give Mount Rainier undisputed title to the highest point in continental United States."

While such news items are good for a chuckle and are quickly forgotten by most readers, an invariable storm of protest is aroused, protests which come straight from the hearts of those who resent the thought that "their mountain" may be submitted to indignity. A lady in Missouri, distressed by the newspaper stories, expresses by letter a sentiment which is typical.

"It is necessary of course, to change

"JOE BEAVER"



U. S. Forest Service

"Here, my friend, agriculture stops and silviculture begins."

nature to conform to the uses and necessities of man. But let us not lay an irreverent hand upon beauty. Let us leave some spots where man can be free from contemplation of humanity with its imperfections and 'Look from Nature up to Nature's God'. From this contemplation he comes back serene and calmed, and ready to shoulder humanity's burden, from which for awhile he has been released."

The height of Mount Rainier, 14,408 feet, remains unchanged upon this Fiftieth Anniversary of the national park.

Even before the establishment of a National Park Service there is ample evidence that natural features were to be protected.

In 1908 the Secretary of the Interior received an application from a man who wished to quarry ice from the glaciers of Mount Rainier. The hopeful prospective permittee, emphasizing that excessive charges for ice prevailed in the cities of Tacoma and Seattle, ten dollars a ton, proposed to construct a flume or tramway from the South Tahoma and Tahoma glaciers to the nearest road or railway, a distance of some five miles. Ice, "fit and suitable for use for all purposes for which ice is used," was to be taken from the glaciers, conveyed to the cities mentioned, and disposed of profitably at a rate less than the exorbitant prices then in effect.

Secretary James Rudolph Garfield denied the application.

Certainly there is little room for monotony in the life of a conservationist. The wise use of our natural resources is an engrossing business. The policies of the various conservation agencies may vary in detail, but the ultimate result must be the same—the most advantageous use of all the immeasurably valuable properties of the people of the United States.

The wheel of conservation turns slowly, but it has covered several degrees of its circumference since the idea of inexhaustible resources was disproved. In times of stress it has faltered, but from somewhere have come the shoulders of far-seeing men and women to nudge it along.

When the second or third generation to come pauses again in contemplation, perhaps upon the occasion of Mount Rainier National Park's Centennial, let us hope that retrospect will reveal that the old folks did a good job, that here and there in our country will remain a few fragments of unspoiled early America. That is the heritage they deserve.



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RAINFALL AND RUNOFF, by E. E. Foster. Published by The Macmillan Company, 60 Fifth Avenue, New York, N. Y. 468 pages, illus. Price \$9.

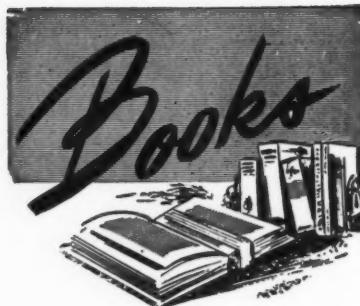
Several million dollars have been spent in the last fifteen or twenty years on hydrologic studies and the accumulation of hydrologic data. This is the first book to make use of this important material in a systematic study of precipitation and runoff. It provides a clear, up-to-date exposition of the scientific principles and methods underlying all problems of water supply, flood control, hydroelectric developments, irrigation, drainage, navigation and other projects that involve the control of water. It fully explains the new methods and data of hydrologic analysis, such as unit graphs and their uses, snow surveys, studies of air masses and their movement, evaporation, and frequencies, as well as previously established methods.

AERIAL PHOTOGRAPHS IN FORESTRY, by Stephen H. Spurr. Published by The Ronald Press Company, 15 East 26th Street, New York 10, N. Y. 333 pages, illus. Price \$6.

Mr. Spurr, assistant professor of forestry at Harvard University, has brought together existing information concerning the use of photographs in forest mapping, inventory and other phases of forest management. His book is written with the hope that it will find use both as a text and as a manual. It is not the intention of the book to cover the entire field of photogrammetry. Rather, it touches only those aspects of that science which are considered to be essential to the forester.

BEGINNER'S GUIDE TO WILD FLOWERS, by Ethel Hinckley Hausman. 376 pages, illustrated, indexed. G. P. Putnam's Sons, New York, 1948. \$3.50.

The novice in the field of wild-flower identification will thoroughly approve of Mrs. Hausman's new book. Others more experienced will be equally appreciative of the style she has used in presenting her material. Because color is most likely to be the attracting force in noting a wildflower, she has grouped her subject matter by color. The casual observer probably would fail to notice a wildling unless it happened to be in bloom. Therefore, the grouping by color is particularly desirable for quick identification. When a plant produces its flowers in more than one



color, both illustration and text are repeated under each color grouping.

More than 1,000 flowers are described and the book is generously illustrated with simple line drawings placed opposite the text. These drawings have the happy faculty of emphasizing the characteristics of each plant that are most easily recognized.

The book applies particularly to the areas east of the Mississippi.

A TEACHING GUIDE TO THE TREES AND SHRUBS OF GREATER NEW YORK, by Arthur H. Graves and Hester M. Rusk. Published by the authors, 1000 Washington Avenue, Brooklyn 25, New York. 76 pages. Price \$1.

Of particular interest to residents of New York or to visitors, this guide, now in its third printing, contains keys to summer and winter characteristics necessary to tree identification, a rather full chapter dealing with the distinguishing characteristics of each native, naturalized and common exotic species occurring in the greater New York City area. A well selected glossary and reference list add to the book's value.

THE ROYAL BOTANICAL EXPEDITION TO SPAIN, Vol. 11, No. 1, by Harold William Rickett. Published by the Chronica Botanica Company, Waltham, Mass. 83 pages, illus. Price \$2.50.

Mr. Rickett, bibliographer for the New York Botanical Garden, has prepared a paper that is both instructive and interesting in his account from documents in the Archivo General de la Nacion in Mexico on the scientific expedition to Mexico authorized in 1788 by Charles III of Spain. The expedition coincided with plans to create a botanical garden in Madrid and the collection gathered by the proposed expedition was to help stock it. The botanical expedition was incorporated August 4, 1787, with the arrival in Mexico of Vincente Cervantes and his colleagues. Despite constant wrangling, slow pay and general administrative red tape, the ex-

pedition slowly made progress, aided materially by a native-born Mexican of Spanish blood, Jose Mocino. How the expedition obtained valuable data and collections despite internal strife and the growing menace to Spain caused by Napoleon is described by Mr. Rickett in his paper.

SMALL-FRUIT CULTURE, by James Sheldon Shoemaker. Published by The Blakiston Company, Philadelphia, Pennsylvania. 433 pages, illus. Price \$4.

A guide for the gardener or the commercial fruit grower, this book covers the growing of grapes, strawberries, bramble-fruit, currants and gooseberries, blueberries and cranberries. Emphasis is placed on practical application. In this second edition new varieties have been added, the latest information on research and experimental work included and all material from the original edition reviewed.

WILDLIFE MANAGEMENT HANDBOOK FOR FOREST OFFICERS (Region 5, 1947), by S. B. Show, A. G. Brenneis, F. P. Cronemiller, R. L. Deering, Ivan Sack, and D. M. Traugh. Published by the Forest Service, U. S. Department of Agriculture, Washington, D. C. 243 pages.

This publication by the U. S. Forest Service undertakes to bring together what is known about wildlife management and to suggest ways to help wildlife without seriously interfering with other uses of timber, range and watershed areas. The book confines itself to conditions and problems found in the national forests of the California region and is designed primarily as a working manual for foresters conducting wildlife management programs.

PREHISTORIC INDIANS OF THE SOUTHWEST, by H. M. Wormington. Published by The Colorado Museum of Natural History, Denver. 191 pages, illus. Price \$2.50.

Archaeologists uncovered the information for this history but it is presented in a form for the layman, tracing the development of southwestern cultures from a time many thousands of years before the beginning of the Christian era through the period of the Spanish Conquest. There is a vivid picture of the life of the cliff-dwellers of Mesa Verde, the canal builders of southern Arizona, and various other prehistoric groups. The appendix lists the outstanding exhibit sites for the traveler, gives directions for reaching them and tells of the accommodations for tourists.



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Tree Planting Machines

(From page 23)

leveled by the use of two hydraulic pistons, each of which raises or lowers, through a linkage, one of the carrier wheels of the machine. Through the medium of the pistons the machine not only is leveled to permit the planting shoe to maintain a vertical position, but the depth of the action of the planting shoe is controlled.

Inasmuch as the machine works on the curves of contours, the beam, coulter planting shoe assembly is swung on a large pin. And, so that the packer wheels can follow around curves, and at the same time straddle the young trees without running them down, the wheel assembly is mounted on the back of the plow beam on a vertical pin, which permits a lateral movement.

The assembly is also mounted on a horizontal pin so that it can float freely when the shoe is in the ground to the desired depth, about eight inches. However, when the shoe is raised, the entire machine is supported on the two carrier wheels which permits pivoting and backing into corners.

The new hillside planter was used to set out a quarter million trees on reservoir areas in the Muskingum district last spring. Some of the planting was done on forty-five percent slopes, which previously were considered too dangerous and difficult to attempt.

There are a number of tree planting machines on the market, among the leading manufacturers being the Harry A. Lowther Company of Joliet, The Wagler Equipment Company of Milwaukee, L. W. Merriam Company of Elsie, Michigan, and the Waldron Machine Works, Valdosta, Georgia. Some machines have been developed

from used farm equipment. All involve the same general principles, but individual improvements are being made steadily as a result of experience in the field.

In recent years, Kimberly Clark, the Mead Corporation and other large paper companies have been buying up large tracts of cutover lands, Jack pine, spruce, Scotch pine, and other pulpwood species are being planted by the millions with machines.

Interest in mechanical planting is particularly high in the South. The International Paper Company was the first to use a tree planter in Florida back in 1946. Now more than fifty machines are owned by timberland owners and operators in that state.

The Champion Paper and Fibre Company planted 1,400,000 seedlings of loblolly and slash pine in South Carolina last season. Of this number, 800,000 were planted by machines.

Planting over 1,500,000 jack pine trees in the space of one month, the Minnesota and Ontario Paper Company last spring successfully completed one of the largest tree planting projects ever undertaken by private industry in Minnesota. Two machines were used.

Costs of machine planting as compared to hand planting varies on various projects. The International Paper Company reports that machine planting has been done in Florida for about \$5.22 an acre, as compared with hand labor costs of from \$7.50 to \$10.95. The U. S. Forest Service checked its costs on a planting project in the Hiawatha National Forest, Michigan, and computed an average of \$4.67 an acre for the machine as compared to \$10.98 for hand planting.

The Chicago and North Western Railway, through the leadership of W. A. Kluender, its forestry agent, is preaching the gospel of machine planting all over the vast territory served by its lines. The company owns a machine, which it uses in giving tree planting demonstrations and loans to farmers and communities for the establishment of forests.

This year around 370,000,000 tree seedlings will be grown by state forest nurseries. Seedlings produced in federal and industrial nurseries are expected to push this figure to more than 400,000,000. In many sections of the country, the machine will carry the brunt of the tree planting job.

Forest Genetics

(From page 33)

long been a barrier to tree breeding. However, many species in the arboretum at the institute have produced ovulate or cone-forming flowers at the precocious age of slightly over six years and many species even younger.

Thus far, few hybrid trees have been used in forest planting. Hybrids showing great vigor will probably become the most used planting stock of the future. Two or three of the most promising are being observed in plantings by the Forest Service throughout the California region.

The first large-scale planting of hybrid pine is being readied with a cross of Jeffrey and Coulter pines. This hybrid is resistant to resin midge and pine reproduction weevil and is expected to be hardy to cold and to grow fast like Coulter pine with the form of Jeffrey pine. It is to be produced in quantity for a field trial of 1000 or more acres.

While some hybrid farm crops will not reproduce themselves, there has been no sterile pine hybrid yet reported and forest tree hybrids do produce enough seed of the improved strain to dominate the forest area.

Control of cross-pollination is essential. Special cloth bags are placed over the cone-bearing branches while the cones are yet unfertilized. The pollen is collected from the catkins of the other parent of different strain and injected into the cloth bags, and a hybrid seed is produced if fertilization is achieved.

With so much encouragement in these endeavors, the geneticists and physiologists have gone on to experiment with newer, faster ways to produce superior forest trees.

This new work is spectacular in that it involves the magic of modern science. It has been found that X-rays cause changes to occur in the chromosomes or character-forming elements of a seed's structure that are permanent in the seedling. These permanent variations from normal can be expected to breed true because it is the heredity-determining structure of the seed that is altered. The treatment has produced some strange trees; and eventually one may be created that will be capable of developing into a veritable giant of the forest in a comparatively short time —like the proverbial bean stalk.

Another short cut in tree breeding being pioneered at the institute is

vegetative reproduction in which branches are cut from superior trees and rooted. In this manner it is possible to eliminate the uncertain two to four years usually required to grow a seedling equal in size from seed. Curiously, it has been found that parts of the same tree may produce trees of different characteristics than other parts.

Other work of the physiologists has been in budding and grafting buds and scions from superior trees on previously rooted seedlings. Though still in the experimental stage, the preliminary budding and grafting tests have shown results. The use of buds and cuttings is important because successful hybrids can thus be propagated without the delay of waiting for seeds to be produced and the additional time required for the seeds to sprout and grow. Still more important, the uncertainty as to the quality of seedling that will be produced from the seed of a hybrid is eliminated.

The science of genetics is past the pioneering stage. The careful and intelligent work done at the institute and elsewhere has provided a sound foundation for future developments. Forest genetics has come into its own as a vital part of the young profession of forestry.

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Operation Snowbound

(From page 9)

close tabs on the severity of the crisis.

On inauguration day Senator Pat McCarran of Nevada, eschewed the festivities and stuck close to his phone. He was too worried to enjoy a parade. That afternoon Ely ranchers George Swallow and C. E. Horton called. Something would have to be done about stranded stock in Nevada and Utah, they said.

"Would an airlift be practicable?" Senator McCarran asked. The ranchers said they didn't know but thought it was worth a try. That evening the senator conferred with the President while the latter was getting ready to attend the Inaugural Ball. Later he called Lieutenant General Lauris Norstad, deputy chief of operations for the Air Force. The general called Fourth Air Force Headquarters in San Francisco and sixteen C-82 flying boxcars were pressed into service. Thus was originated the greatest bombing operation since the war—the bombs being 100-pound bales of hay and alfalfa for starving stock.

By January 23 the situation had worsened and the President wrote Federal Works Agency's Major General Philip B. Fleming requesting that he coordinate a "disaster of national proportions." General Fleming, acting as the nation's No. 1 trouble shooter for the twenty-first time, received the letter late in the afternoon and moved with characteristic dispatch to obtain priorities on railroad movements for snow removal equipment and feed for stock.

At a conference of ace trouble shooters the next morning (departments represented included the Army, Navy and Air Force, Interior and Agriculture departments, Council of State Governments, the Public Health

Service, Red Cross and the Federal Works Agency), it was agreed that stock relief was the most pressing immediate problem. Suggested use of flame throwers and high explosives as an ideal means of breaking through to isolated herds was politely shelved. Also discarded was the suggestion of a Pittsburgh inventor to drop old motor oil in the vicinity of the herds of cattle and sheep and set it afire. The chilled stock "would follow the warmth of the fire, the snow would be melted and forage uncovered," he said. The holes in the snow would also provide shelter from the wind.

With all manner of interesting suggestions to consider, the coordinators voted in favor of bulldozers, cats, rotary snowplows and weasels as the most likely bet for licking the problem. As a result, consignments of this type of equipment were soon rolling toward the plains country from as far east as St. Louis and as far west as San Francisco. With the Red Cross already providing yeoman service in rescuing and providing for stranded humans, and the Air Force ready to expand its grublift operations, hope was expressed that combined forces could soon strike a powerful blow toward the liberation of all buried areas.

Another key problem was that of concentrating stock feed at strategic points for delivery by motor convoy and plane. With the price of baled hay skyrocketed from \$30 to \$60 a ton the government declined to buy feed outright for ranchers. Rather, it started farflung rail movements of feed from Canada and the eastern states.

With this first meeting in Washington, what had been a piecemeal battle now began to take on an integrated over-all pattern. Fifth Army activated its standing disaster-aid plan for western states and General Lewis Pick, of Ledo Road engineering fame, established headquarters at Omaha and tackled the job of clearing secondary roads in Nebraska, South Dakota, eastern Wyoming and later in North Dakota. At the height of the fight, Pick's force of 4,000 men had 673 bulldozers, 123 graders and 116 weasels in Nebraska alone. And by February 22 this hard-hitting task force had liberated 74,418 people, reached 1,387,239 snowbound cattle, 338,000 other animals and opened 33,168 miles of road.

The Bureau of Land Management was conducting snow-removal operations in Utah, Nevada, northern Ari-

zona, northwestern Colorado, Montana, Idaho and three counties in western Oregon. Equipment from the Forest Service, National Park Service and other agencies augmented the effort. The bureau spent a total of \$1,200,000 in the drive and established emergency headquarters at Salt Lake City, Utah, and Billings, Montana. These units cleared an estimated 10,000 miles of roads and trails—some of it two and three times.

By all odds, the big dozers, rotary snowplows and cats proved the most effective in coping with the snow-removal problem—and what was known as the "convoy system" liberated the most snow-locked land. This consisted of a fleet of twenty or more supply-laden trucks creeping bumper to bumper behind a working dozer or cat. Since convoys were out for days at a time, bulldozers generally were followed by their own fuel truck and a trailer for operators, who worked in shifts. These convoys followed existing roads when possible; when not they set off across country on a compass bearing. One indication of the intensity of the storms is that snow frequently started to drift in around the fifth truck in such pro-cessions.

With the bulk of his "troops" committed to the fight, General Fleming expedited matters by prompt conversion of federal funds appropriated for the emergency into liquid cash for the rental of equipment. In all, \$1,500,000 were provided from the President's Emergency Relief Fund. The President and the Secretary of Defense further expedited what was becoming a complicated state problem when it gave the Army authority to take over contract equipment already in use and for which the states had no money to pay. The Army's bill has not been submitted as yet but in

Nebraska alone it will be at least a million.

While there has been considerable discussion pro and con regarding the relative merits of the airlift as a practical effort for saving livestock, there was never any question regarding the effectiveness of the air arms in delivering their loads of hay and concentrates, foods and supplies, and in liaison work. The Air Forces' twenty-four-day lift to Nevada ranchers delivered 1,879 tons of cattle feed, regular food rations, medical supplies and emergency medical equipment. In all, approximately 115 USAF aircraft were active in Arizona, Idaho, Wyoming, Utah, Nebraska and North and South Dakota. Planes of the Navy, Air National Guard and the Civil Air Patrol also took part in the relief flights.

When a diphtheria epidemic was believed to be threatening the Navajo Indian Reservation, 1000 blankets, 150 cots, fuel oil, medical supplies and 206 blood plasma units were delivered by air. Food packages weighing 101 pounds were dropped by both service and Red Cross planes to isolated families.

When her food package fell in an immense snow drift, Mrs. Mary Emerson, of Ouray County, Utah, didn't know quite how to proceed. Ten-year-old Willie, the eldest of three hungry children stranded with their mother, offered to go after it. To play it safe, Mrs. Emerson attached a clothes line to his belt so as to reel him out of the drift. Willie plowed in and, after a brief interval of suspense, his mother gave the line a tug. Out came Willie to announce that the package was "hooked." Together, the family reeled it in.

As regards the haydrops to livestock, there were those who said the hay killed large numbers of cattle because no one was on hand to stop



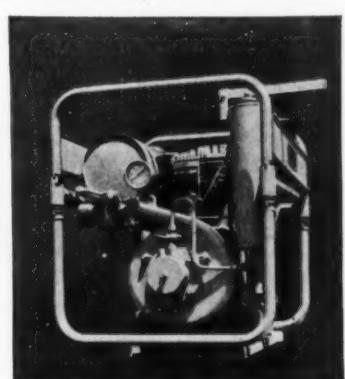
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them from gorging. Other ranchers reported the drops were not always accurate and that sheep in particular had difficulty in reaching the supplies. These criticisms are of interest—but the fact remains that much marooned stock undoubtedly would have perished had it not been for the grub-lift.

While the big effort was being made in the West, another type of relief operation was shaping up in Washington. This was in the form of a legislative program to aid stricken ranchers and farmers unable to obtain loans from banks due to insufficient collateral. Western senators and representatives presented bills to cover the problem, but as of March 10 it seemed certain that proposed relief measures would boil down to what might be termed short-range and long-range plans.

The short-range plan was proposed by Senator O'Mahoney and would appropriate \$4,000,000 of \$6,000,000 left over from the Columbia River flood damage appropriation of 1948 for immediate use. The money would be made available through county offices of the Farmers Home Administration. This proposal seems almost certain of approval as it has been presented as an amendment to the First Emergency Efficiency Appropriation Bill approved by President Truman in his budget.

The long-range measure, also proposed by Senator O'Mahoney, would transfer a \$45,000,000 revolving fund of the Regional Agricultural Credit Corporation to the Secretary of Agriculture. The bill, Senate File 913, introduced February 10, would empower the Secretary to make loans to farmers and stockmen in any area where disaster has created a need for agricultural credits. Loans would be at three percent interest.

This bill followed the same general pattern of one introduced by Congressman Walter Granger, of Utah, who proposed, however, that the RACC actually administer the loans. But since the RACC is now in the process of liquidation it was decided in committee, for the sake of expediency, to adopt the O'Mahoney measure.

Both measures should go a long way in helping hard-pressed stockmen and ranchers over the hump—especially small operators. The pressing need is now. Lost stock undoubtedly should be replaced and, despite the fact that feed is costing almost as much as stock is worth in many cases, the animals nevertheless must be fed.

Conservation and the Hoover Report (From page 13)

scientific, economic and social research activities be brought "into a Research Service, and divided into appropriate bureaus, i.e., crops, forest and range, animals, structures and machines, soil and water, human nutrition and home economics, marketing and utilization and agricultural economics," with the understanding that management and operational research should be conducted by the respective services.

The commission further recommended that "In the future, new federal agricultural research stations should generally be established only where existing joint federal-state facilities cannot be developed to fill the need."

The task force on agriculture deviated slightly from its basic logic in the field of forest education and demonstration practices by recognizing a distinction between work with small woodland owners and the larger industrial forest holders. The approach to the 4,500,000 small woodland owners admittedly requires different techniques than does the approach to the 5,000 large timberland owners. Accordingly, it recommended that educational and demonstration work directed to farm woodland owners continue to be a function of the Extension Service, but the Forest Service pattern of cooperation with state forestry agencies would be retained. In doing so, a clear distinction is made between the educational and demonstration responsibilities, long accepted as the field of the Extension Service, from individual and personal services. In this case personal services to woodland owners and larger forest properties are singled out as a field of responsibility for state officials. The principle under which such service work would be performed can perhaps best be described in a paraphrase of the commission's tenth recommendation: Assistance to owners of forest land which is clearly for the benefit and protection of the general public should be a public expense. In contrast, services or assistance which are primarily for the benefit and protection of the forest owners should be paid for by the forest owner.

Following the functional organization of the Department of Agricul-

ture as recommended by the commission, all educational activities would be integrated and coordinated in the Extension Service. The object is to channel educational work, demonstrations, and methods of teaching through this agency. Obviously, however, the Forest Service or its successor would have authority to publish information about its program and the basic facts concerning them. It would also be free to meet special situations such as arise from the forest fire prevention and protection programs.

Under the overall administration of the Agricultural Resources Conservation Service there would also be the Soil and Water Conservation Service. As successor of the present Soil Conservation Service this agency would be responsible for federal programs designed to encourage adoption of practices that will conserve soil on state and privately-owned lands. The public domain would be only an indirect responsibility.

The new bureau would administer agricultural conservation payments. It would see that the results of research are available through the Extension Service to the soil-conservation districts. It would also act for the Secretary in making investigations and in determining the agricultural feasibility of proposed reclamation projects. Water resources surveys and development plans for upstream flood control programs would be a function of the Soil and Water Conservation Service, but their planning and execution on public lands could often be best done in cooperation with the Forest and Range Service. Cooperation may also be necessary with other federal and state agencies. For prompt decision on questions involving the interests of other departments of government, the task force recommended creation of an interdepartmental committee in the Office of the President for their review and decision.

The centering in one administrative service of soil and water conservation with the administration of forests and range is believed by the agriculture task force to assure the wise

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and rebuild the privately-owned lands. The public domain would be only an indirect responsibility.

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use of the nation's soil, water, timber and range resources. It will conform with principles of good organization by reducing the number of officials directly responsible to the Secretary of Agriculture.

(Editor's Note: Principal recommendations of the task force on natural resources, which Mr. Collingwood states differed with the conclusions of the task force on agriculture, and with final proposals of the Hoover Commission, are as follows:

Establishment of a consolidated Water Development Service, to administer the present functions of the Bureau of Reclamation, the river development functions of the Corps of Engineers, the power marketing functions of the Bonneville and Southwestern Power Administrations and the Division of Power in the Department of the Interior, certain river-development functions now administered by the Federal Power Commission, and certain functions of the Department of State relating to international boundary streams.

Retention of the Tennessee Valley Authority in its present form, but the establishment of additional valley authorities is opposed.

Establishment of a consolidated Forest and Range Service, based upon the present Forest Service and furthering its general policies, but including the forest and range management functions of the Bureau of Land Management and research functions of the Agriculture Department relating to forest insects and diseases.

Regional decentralization of the Water Development Service and the Forest and Range Service, by river basins where practicable, to facilitate "grass roots" decisions, interservice cooperation and local participation in planning.

Division of the Fish and Wildlife Service into two units, a Fisheries Service and a Wildlife Service.

Establishment in the Executive Office of the President of a Board of Coordination and Review to the end that only economically feasible projects shall be instituted by the resource agencies and especially by the Water Development Service.

Reestablishment of the General Land Office as a record-keeping and title-holding agency for public lands.

The union into a Department of Natural Resources of the Water Development Service, the Forest and Range Service, the Geological Survey, the Bureau of Mines, the National Park Service, the Fisheries Service, the Wildlife Service, and the General Land Office. The Department of the Interior would cease to exist.

This Month With The AFA

State by state solution of forestry problems has been one of The American Forestry Association's theme songs in recent years. And from events reported by AFA members and in other programs in which the AFA staff has been active, it looks as if a lot of progress is being made.

In Oregon, Governor Douglas McKay has called various conservation divisions together in what he indicated would be an advisory board "with responsibility to take initial steps to coordinate their individual programs, without sacrificing their individual administrations."

And in Mississippi, Governor Fielding Wright served an ultimatum to forest owners and industry to conserve their timber resources on a voluntary basis or be faced by strict state regulation. As an outcome, a five-man committee was appointed from each of three divisions in the state to develop a definite timber conservation program for all owners and industry on a voluntary basis—and in such a manner as to produce results.

The U. S. Chamber of Commerce, through its natural resources department, is also working toward bringing businessmen closer to conservation. The plan originated with W. S. Rosecrans while he was president of The American Forestry Association, and as finally developed at a recent conference in New Orleans will operate in two steps—(1) state by state meetings with business leaders and conservationists to air forestry problems and what's being done about them, and (2) follow-up activities by local chambers to push forestry. The plan is not one of duplication, but to tie in with programs of existing organizations and agencies.

Harris Collingwood, former AFA forester, will head up the project for the chamber. Along with the American Forest Products Industries, Inc., the AFA, in on the original planning, will continue its cooperation as the program develops. AFA members will be asked to participate in each state.

In Philadelphia in March, many AFA members attended the meeting of the Pennsylvania Forestry Association to help initiate a statewide forest fire prevention program. Lloyd

Partain, AFA director, and A. G. Hall, AFA forester, were speakers on the program. With energetic Sam Custer serving as executive secretary, AFA members are glad to see the gathering momentum of the Quaker State organization.

E. L. Kurth, AFA director from Texas, has sent us a long-range program of action recently developed by the Texas Forestry Association which will put plenty of power and punch into that organization's drive for better forestry.

Beginning soon, the content of *American Forests* will swing more toward broad land use, on a worldwide basis. This is in line with recommendations made by the Editorial Advisory Board created last October to outline definite proposals for the magazine's expansion and improvement. Members of this board were published in the March issue.

Among the articles now being processed for publication under this new policy are *The Cradle of Rivers*, by Bernard Frank and Anthony Netboy, a graphic and comprehensive picture of a watershed; *Where Will We Get Our Seed?*, by John B. Woods, a realistic appraisal of one of the major problems in worldwide tree planting; *Soil Conservation District*, by Nort Baser, a vivid and intimate look at this pattern of achieving better land use; and *Trusteeship of the Land*, by Kent Leavitt, a moving and frank analysis of man's responsibility to the land which sustains him.

In preparation are articles dealing with resource conditions in Alaska, in Greece, Sweden, Venezuela, Australia and other lands around the globe; articles dealing with the pulp and paper industry, with wildlife refuges, with wilderness areas and national parks, with industrial forestry, with our tropical forests, with insects and disease, with all the various forms of outdoor recreation, at home and abroad.

Hats off to the Wildlife Management Institute for its very successful conference at Washington this month. There were plenty of topics to suit the varied tastes of conservationists.

On the program were AFA director Kent Leavitt and honorary vice-presidents Charles F. Brannon, Sec-

retary of Agriculture, Congressman Clifford R. Hope, Stanley Fontanna and William Vogt.

William Voigt, Jr., of the Izaak Walton League, drew a lot of praise for his punchy talk on the public land situation.

The American Forestry Association was host to the President's Quetico-Superior Committee at which was shown the new sound color movie "Wilderness Canoe Country." AFA with forty other organizations has been a part of the movement to preserve this wilderness area in northern Minnesota.

Bouquets to R. S. Kellogg of the Newsprint Service Bureau, who in February was an AFA member of forty-eight years' standing. He celebrated the occasion by presenting our library with a copy of his new book *Newsprint Paper in North America*.

Twenty-third patron member of AFA to be greeted is Miss Julia M. Neppert of San Francisco, California, who has dedicated a large part of her life work to school teaching.

New life members to be welcomed to AFA this year include: Mrs. Hiram C. Bloomingdale of Florida; Mrs. Alma Thomas of Texas; Carl M. Smith and Cam Buck Comer of North Carolina; Horace C. Jenkins and Alice McMurtie Biddle of Pennsylvania; Mrs. W. G. Reynolds of Delaware; Dudley Pickman Rogers of Massachusetts; Paul Mellon of Virginia; Lulu Evelyn Kilpatrick of Missouri, and Bertha H. Mengedoht of Nebraska.



WILLIAM VOIGT, honorary vice-president, addressed Wildlife Conference

EDITORIAL

A National Resource Corporation

A proposal which promises to usher in a season of cross-fire discussion among people concerned with problems of natural resource conservation is contained in a booklet, *Our Conservation Job—A New Way to Obtain Soil and Range, Forest, Fuel and Energy Conservation*, issued in March by the Public Affairs Institute of Washington, D. C. Its author is Stephen Raushenbush, consulting economist attached to the institute's staff. His background in the field of public affairs includes service as a state industrial director of Pennsylvania during the governorship of Gifford Pinchot, and eight years as resource economist in the office of former Secretary of the Interior Harold Ickes.

In sixty-two pages, the booklet undertakes to point up resource problems across the board but its challenging proposal relates to more speedy solution of those in the fields of forest and soil conservation. In a breakdown of costs, it estimates expenditures called for to bring the nation's crop lands up to maximum productivity at \$11,000,000,000; forest lands, \$5,000,000,000 and rangelands \$250,000,000—a total of better than \$16,000,000,000. Declaring the present governmental system of financing conservation investments out of current federal and state appropriations is wholly inadequate, considering the magnitude and emergency of work needing to be done, a short cut to hurry-up accomplishment is proposed through the establishment of a federal credit agency to be known as the National Resources Corporation.

The corporation (NRC) would be authorized to issue and sell bonds bearing a minimum interest rate of three percent and a maximum of five and a half percent. They would be guaranteed as to principal and minimum interest by the U. S. Treasury. Bonds outstanding at any one time could not exceed \$13,000,000,000. The corporation would be further empowered to make loans to borrowers for forest conservation projects at two and a half percent and for soil conservation projects at three and a half percent. Projects would be certified in advance as "clearly and indisputably sound as an investment" by the U. S. Forest Service, the Soil Conservation Service or similar federal agencies, and they would have to be approved by local groups of resource interests or state agencies. Loans would include the cost of "expert" services supplied by federal and state agencies in making project examinations, certifications and subsequent inspections of the borrower's conservation work. Federal agencies would be responsible for the soundness of loans.

Bonds issued by NRC would be for from twenty to sixty years. Loans made to borrowers would permit variable periods of deferment in the payment of principal and interest. Borrowers would be required to compensate tenants for capital improvements the tenants make to the land. Another unique feature is the requirement that in addition to the repayment of principal and interest, borrowers would agree to divide any increases or "windfalls," as they are called, resulting from higher prices received for products from project lands with bond holders in the ratio of sixty percent to the borrower and forty percent to the bond holder.

Under the corporation's loan authority, federal and state agencies engaged in conservation work would qualify as borrowers the same as those concerned with private land protection and improvement. States could obtain loans for certified state, regional and county projects; the federal forest service would be eligible for loans for national forest improvements such as tree planting, reseeding ranges, ex-

pansion of forest areas, the building of access roads to now inaccessible commercial timber. In respect to federal agencies, the transaction would appear to be a case of the government paying three percent for money which it turns around and loans to itself at two and a half percent. Presumably the authors of the plan anticipate that "windfalls" from the use of its own money will more than make up the difference, cover the cost of administration and cover the interest due bond holders.

The reader of this imaginative document will not be inclined to dispute the institute's contention that conservation progress is shackled by the magnitude of the job ahead and the costs involved, or that the current annual appropriation process is not adequately adjusted to the long-range task. Its approach to accelerating action, however, is based on the theory that ready access to credit will open the flood gates to conservation progress. This, in our judgment, is an unrealistic and misplaced assumption and one that makes the establishment of a new federal credit agency in the loose and involved framework of that proposed an exceedingly high-risk use of public money.

The idea of providing more ready credit facilities is not new in the forest field. For a good many years it has been recognized and supported as one of many desirable aids, but experience and study on the ground has not shown that inadequate credit facilities has been a major deterrent to conservation practice.

Establishment of an independent corporation to sell bonds in the open market at rates competing with regular Treasury financing seems an unnecessary and costly way to supplement present credit needed for conservation undertakings. If the purpose is to lighten the appropriation responsibility of federal and state legislatures for conservation of natural resources, a simpler and more economical procedure would seem to be to authorize existing agencies such as the Farm Credit Administration or the Federal Land Banks to work out and extend a type of credit fitted to forest and land conservation projects.

Forest conservation is most lacking on the large area of lands embraced in farm woodlands and small ownerships. Experience indicates that the most effective means of bringing about improved practices among these owners is on-the-ground instructions and demonstrations in woodland management by trained foresters. Without this preliminary work, we do not think that loan inducements such as offered by the proposed NRC would be other than a minor stimulant to conservation practice.

The administration and cost of the proposed National Resource Corporation in all its ramifications is not discussed in the institute's booklet. Placing responsibility on other federal agencies for examination and appraisal, for checking on the borrowers' work to assure success of the investments, for determining what are and what are not "windfalls" by virtue of increases in market prices poses a bewildering problem of administration and costs that the institute seems not to have taken into account.

We cannot believe that the proposal will receive very wide support. Perhaps the institute does not expect it to, but is putting it forward as a challenge to bolder action in the resource field. The organization is a newcomer in this field. Sponsored by a group of citizens, many of whom are nationally known for their New Deal liberalism, the institute promises to be an active addition, as evidenced by the fact that it has issued a call for a National Emergency Conservation Conference to be held in the Department of Interior auditorium in Washington, May 12, 13 and 14. The proposed National Resource Corporation is listed as one of the subjects for discussion at this conference. If attended by many grass-root conservationists it should be a lively occasion.

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